The Secret to Better RAID
It's called Matrix RAID. Step-by-step instructions on page 65!

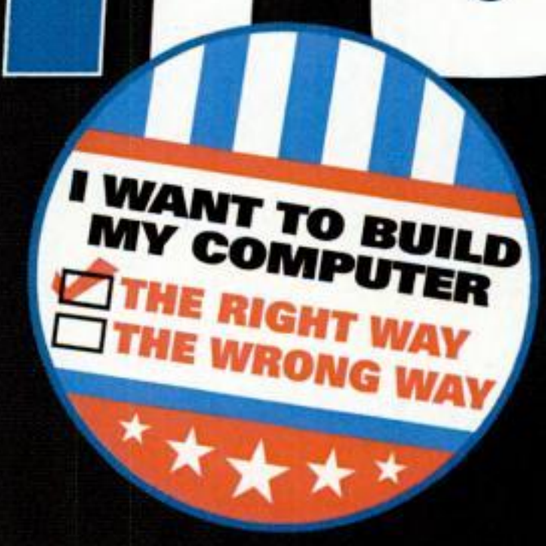
$400 Videocard Shootout
Two midrange videocards: One hits, the other misses!

The Sims 2: Kinky, Baby!
Miss this awesome sequel and regret it for the rest of your life

MAXIMUM PC

MINIMUM BS • NOVEMBER 2004

BUILD your own PC



New technology demands new techniques. We show you how!

ASSEMBLE THIS PC IN 3 HOURS!
All you need is a screwdriver and this jam-packed magazine!

Plus...

34 No-Bull Reviews!

LCDS

MOTHERBOARDS

MEDIA PLAYERS

PHOTO PRINTERS

and more!

future network usa
Media with Passion

EXCLUSIVE! 3DMARK 2005—WHY IT'S THE TOUGHEST 3D BENCHMARK EVER

Copyrighted material

THE DELL XPS GAMING PCs. SIDE EFFECTS MAY INCLUDE FRIED BRAIN, SLEEP DEPRIVATION AND WALLET OBESITY.

Inspiron XPS Notebook shown with Skullz design option.

*__Pricing/Availability:__ Prices, specifications, availability and terms of offers may change without notice. Taxes, fees, and shipping charges are extra and vary. Valid for U.S. Dell Home Systems Co. new purchases only. Dell cannot be responsible for pricing or other errors, and reserves the right to cancel orders arising from such errors. **Limited Warranty:** You can get a copy of our limited warranties and guarantees by writing Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682. To purchase warranty only or for information on other service options, please call 1-800-915-3355 or visit www.dell4me.com/termsandconditions. **Service:** At-Home service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. Other conditions apply. **DVD+RW and DVD+RW/+R Drives:** Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R media provides maximum compatibility. Special media required, and third party software may also be required. **PURCHASE PLAN: Dell Preferred Account:** Offered by CIT Bank to qualified U.S. residents with approved credit. Taxes, fees and shipping charges are extra and vary. **Gigabit Ethernet:** This term does not connote actual operating speed of 1GB/sec. For high-speed transmission connection to a Gigabit Ethernet server and network infrastructure is required. **Hard Drive:** For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. **PC Home Installation:** Does not cover repair services. Subject to customer's contract with third party. See dell.com/servicescontracts for details. Availability varies. Other conditions apply. Please see your contract with the service provider for other important details. Card cannot be returned once it is installed. **Trademarks/Copyright Notices:** Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. ©2004 Dell Inc. All rights reserved.

Copyrighted material

DELL XPS GAMING PCs. Power. Speed. Affordability. And unparalleled experiences that'll leave you thinking "PC" stands for "perfect combination." High-quality technology, expandability, sleek designs, and a 24-hour-a-day support staff of real gamers make it the complete package.

>>> Bottom line, you win.

DELL™ DIMENSION™ XPS ULTIMATE GAMING DESKTOP

More award-winning machine than you'll ever need, thanks to the kickin' 460 watts of power to support ultra high-end graphics cards, Intel® processors, and big-time bandwidth for now and into the future. Not to mention the cooling capability (5 ultra quiet fans) to keep the system cool and quiet so the sound is crystal clear. Top it off with an easy to upgrade chassis design and you can sum it up in a word. Sweet.

- **Intel® Pentium® 4 Processor 540 with HT Technology (3.20GHz, 1MB L2 cache, 800MHz FSB)**
- **Microsoft® Windows® XP Home Edition**
- 1GB Dual Channel DDR2 SDRAM
- 80GB* Hard Drive
- 256MB PCI Express™ x16 ATI™ Radeon™ X800 XT
- 16X DVD-ROM Drive
- 48x CD Burner/DVD Combo
- Sound Blaster® Audigy™2 (D) Sound Card
- 19" (18.0" v.i.s., .24dp) M993 Monitor
- 1-Yr Limited Warranty*, Mail-in Service, & XPS Telephone Support

Power Pack this configuration for $239:
- 160GB* SATA Hard Drive
- Dell 5650 5.1 Surround Sound Speaker System with Subwoofer
- 2-Yr Limited Warranty*, At-Home Service*, & XPS Telephone Support

E-VALUE Code: 01579-D51027x

$2499 or as low as **$75**/mo.*
E-VALUE Code: 01579-D51024m

Dell recommends Microsoft® Windows® XP Professional

DELL™ INSPIRON™ XPS ULTIMATE GAMING NOTEBOOK

Bring your games along for the ride with some of the latest Intel® processors, a built-in subwoofer and Gigabit Ethernet.* (Can you say...LAN parties?) We'll even up the ante with freebies like any one of our three slick design options and a killer XPS backpack. You'll be locked and loaded in style.

- **Intel® Pentium® 4 Processor with HT Technology (3.40GHz, 1MB Cache, 800MHz FSB)**
- **Microsoft® Windows® XP Home Edition**
- 15.4" UltraSharp™ Wide Screen UXGA Display
- 512MB DDR SDRAM at 400MHz
- 60GB* 7200 RPM Hard Drive
- 8X CD/DVD Burner (DVD+RW/+R*)
- 256MB DDR ATI's MOBILITY™ RADEON™ 9800 AGP 8X Graphics
- 12 Cell Lithium Ion Battery (96WHr)
- 10/100/1000 Gigabit Ethernet*
- 1-Yr Limited Warranty*, Mail-in Service, & XPS Telephone Support

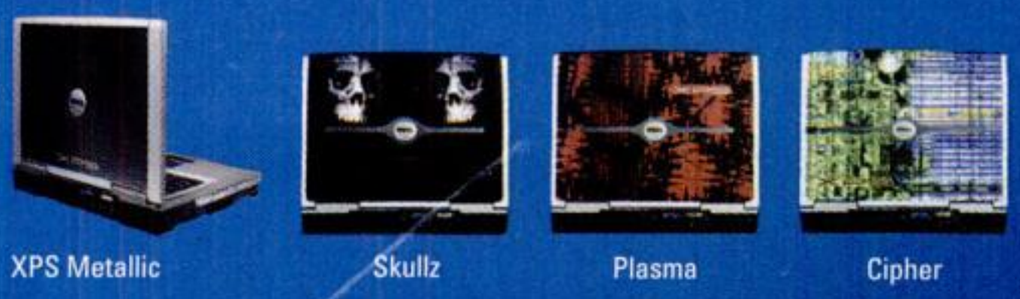
Power Pack this configuration for $350:
- 1GB DDR SDRAM at 400MHz
- 100GB* Hard Drive

E-VALUE Code: 01579-D81033m

$2999 or as low as **$90**/mo.*
E-VALUE Code: 01579-D81029m

Dell recommends a 3-Yr Limited Warranty*, At-Home Service*, & XPS Telephone Support for $279

NOW AVAILABLE!
- Upgrade to 256MB graphics card for current XPS owners. Only $499! Includes PC Home Installation.* Visit www.dell.com/xps to order!



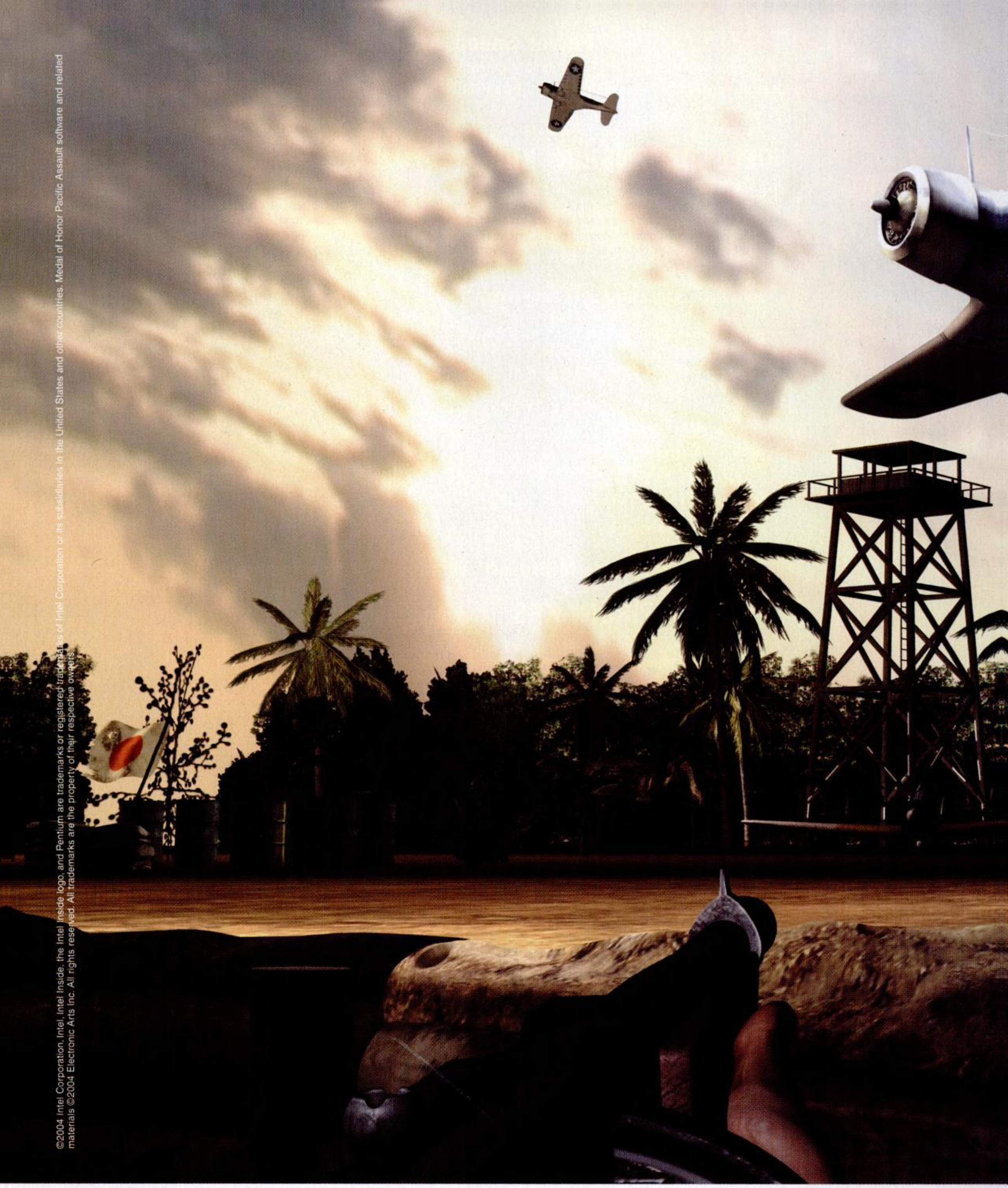
XPS Metallic | Skullz | Plasma | Cipher

For games, joysticks and all the hardcore gear you need to blur the line between cyber and reality. Go online or call.

Intense Gaming. Easy as DELL™

Click www.dell.com/maxpc Call 1-877-699-3355 toll free

Copyrighted material



©2004 Intel Corporation. Intel, Intel Inside, the Intel Inside logo, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Medal of Honor Pacific Assault software and related materials ©2004 Electronic Arts Inc. All rights reserved. All trademarks are the property of their respective owners.

**Make sure you play *Medal of Honor Pacific Assault*™ on a PC powered by
it just isn't fair. To get a free download to optimize your motherboard fo**

T Blood Language Violence

Game experience may change during online play.

*Look for systems with the Intel® Pentium® 4 Processor with HT Technology logo which your system vendor has verified utilize Hyper-Threading Technologg

Copyrighted material

Run for your life!
He's using Hyper-Threading Technology.

This One

4ZB6-FXH-S8NF

intel inside HT pentium 4

the Intel® Pentium® 4 Processor with HT Technology.* Otherwise, faster game play, visit intel.com/go/gaming.

*Performance will vary depending on the specific hardware and software you use. See http://www.intel.com/info/hyperthreading/ for information.

intel®

Copyrighted material

LG FLATRON LCDs.

Available in LG, XLG and XXLG.

©2004 LG Electronics U.S.A., Inc.

Because one size does not fit all.

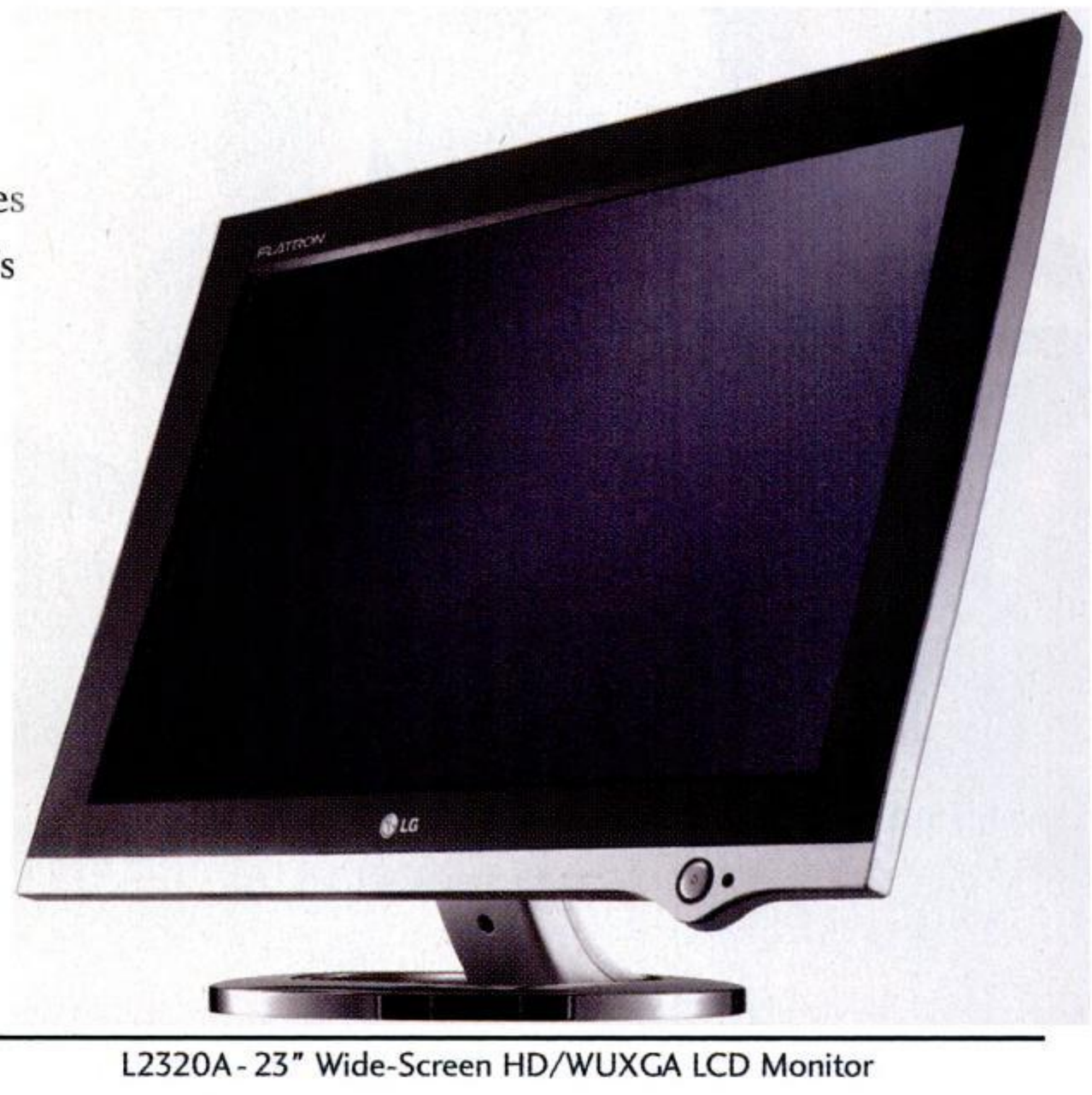
With screen sizes from 15" to 30", offering features such as DVI and HD inputs or TV function, there's a perfect LG fit for every home or office. LG LCD monitors offer exceptional quality, innovative features and are all backed by an outstanding 3-year replacement warranty.

The view is better with LG.

Available at:

BEST BUY

BestBuy.com



L2320A - 23" Wide-Screen HD/WUXGA LCD Monitor

www.LGUSA.com

FLATRON®

LG

Life's Good

Copyrighted material

Release Notes

Murphy's Magazine Law

The Murphy's Law of magazine publishing is this: Once a year, you will put an issue to bed and then watch in sinking despair as, days after the issue has been shipped to the printer, some kind of development occurs that renders part—or in horrible, horrible circumstances—all of your cover story inaccurate.

Murphy's Law finally caught up with *Maximum PC* last month in our October issue. Our cover story was a preview of the new version of Windows, code-named Longhorn. In the feature, Technical Editor Will Smith discussed a number of the new operating system's most exciting features. Included in this discussion was WinFS, a new—well, kind of, but more on that in a second—database-based file system that promises to make search functionality and file indexing in Windows much faster than it currently is. We're talking Google-like speeds.

Well, not anymore. About seven days after we finished the issue, Microsoft announced that it was removing WinFS from Windows Longhorn in order to have the OS ready by 2006. Let me tell you, as an editor, the moment you read "bad" news like this, it feels like someone just punched you in the stomach. Thankfully, we didn't tout WinFS on the cover; my initial cover lines mentioned it, but I changed them at the last second. Chalk one up to divine intervention, uncanny intuition… or maybe some kind of publishing karma.

Amazingly, Microsoft almost did it to us again this month. Just as I was prepping to write a shoot-out between the latest batch of Media Center PCs, Microsoft announced it would release a major revision of the WinXP Media Center Edition OS in mid-October—right when you would be reading this issue.

Because Microsoft is so tight-lipped about stuff like this, I discovered the information the hard way: by sheer luck. I was talking to a hardware vendor about something entirely unrelated, when he casually mentioned the introduction of Symphony—the code-name for Windows XP Media Center Edition 2005—on the company's Media Center PCs. Cue record-scratching sound, accelerated heart beat, and frantic conversations about postponing an already mapped-out feature story. Thankfully, I found out about this development a few weeks before we went to print, allowing us to postpone the story until next month.

The upshot is that this new version of WinXP Media Center Edition features some significant changes that should allow it to better compete with TiVo. Time will tell; I'm starting my investigation now, and you'll be able to read about it next month in a detailed walk-through of all the OS' new features and a close look at a bunch of Media Center PCs. If, that is, Murphy's Law doesn't strike again. It shouldn't—we already got our dose of it this year.

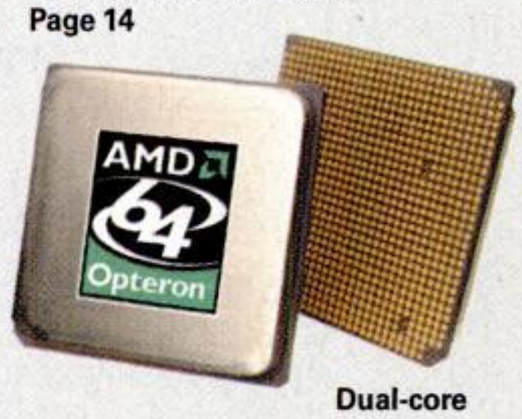
I shouldn't have said that.

—GEORGE JONES
george@maximumpc.com

Contents

11.04

DRM in its many guises
Page 14



Dual-core CPUs
page 15

***3DMark05* arrives!**
Page 72

REGULARS

8 In/Out
You write, we respond

14 Quick Start
PC previews, news, and factoids

22 Head2Head
This month: Free e-mail clients

26 WatchDog
Maximum PC takes a bite out of bad gear

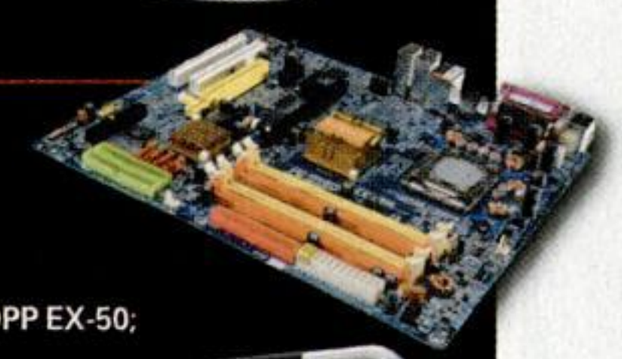
68 Ask the Doctor
Symptom, diagnosis, cure

65 How To...
This month: Matrix RAID

72 In the Lab
A behind-the-scenes look at *Maximum PC* product testing

120 Rig of the Month
It's amazing what a person can do with a PC!

REVIEWS



74 Videocards: Asus V9999 Gamer Edition; XFX GeForce 6800 GT
76 LCD monitors: Samsung SyncMaster 173MW; LG Electronics L1730S
78 Double-layer DVD burners: Freecom Classic Dual Format; Memorex 16x Dual Format
80 Motherboards: Abit AA8 DuraMax; Gigabyte GA-81915P Duo (Pro)-A
82 MP3 player: Creative Zen Touch
82 5.1 speakers: Logitech Z-5500 Digital
84 2.1 speakers: Swans M-200
84 Webcam: D-Link Wireless Internet Camera
86 Portable photo printers: Canon CP-220; Sony DPP EX-50; Olympus P-10; Epson PictureMate
88 DV camera: Concord Solid-State
88 External drive enclosure: Arco EZBackup
90 USB keys: SanDisk Cruzer Titanium USB; Victorinox Swiss Memory; PQI Intelligent Stick 2.0
92 Case enclosures: Cooler Master CAC-T05 Centurion 5; Silverstone SST-TJ06
93 Handheld media player: Zen Portable Media Center
94 4-bay SATA kit: MacGurus Burly Kit
94 DVD burning app: 123 Copy DVD

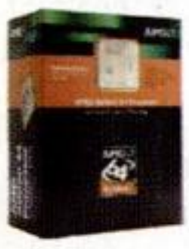
GAMES

95 The Sims 2
96 5 Pocket PC games

Copyrighted material

newegg.com™

ONCE YOU KNOW, YOU NEWEGG.



AMD Athlon™ 64 3400+
512K L2 Cache
64-Bit Processor
Model# ADA3400AXBOX

$299.00

AMD Athlon™ 64 3500+
Socket 939 512K
L2 Cache 64-Bit Processor
Model# ADA3500AWBOX

$369.00

$869.00

AMD Athlon™ 64 FX-53
1MB L2 Cache 64-bit Processor
Model# ADAFX53ASBOX

$215.00

AMD Athlon™ XP 3200+
512K L2 Cache Processor
Model# AXDA3200BOX

$129.00

AMD Sempron™ 3100+
Socket 754 256K L2 Cache
Model# SDA3100AXBOX

AMD Athlon™ 64 Technology

- The only Windows®-compatible 64-bit processor
- Streamlines multitasking performance with HyperTransport™ technology, invented by AMD, which removes I/O bottlenecks, increases bandwidth and reduces latency
- Enhanced virus protection for the upcoming Microsoft® Windows® XP SP2
- Cool'n'Quiet™ technology offers performance-on-demand capability to reduce energy usage and enable a quiet environment for home computing

Barebone Systems

$285.00

Shuttle SN85G4V2 XPC for
Socket 754 AMD Athlon 64 CPU

$210.00

AOpen EZ18 XC Cube for
Socket A FSB AMD CPU

SOYO SY-A43A0 for
Socket A FSB AMD CPU

$87.00

Digital Cameras

$179.99

Canon PowerShot A400 3.2 MP
2.2x Optical 3.2x Digital Zoom

$549.99

Konica Minolta DiMAGE Z3
4MP 12x Optical 4x Digital Zoom

$399.99

Sony DSC-P100/S 5.1MP
3x Optical 6x Digital Zoom

Components

$313.00

Corsair XMS Xtra-Low
Latency 184-Pin 1GB (512MBx2)
DDR SDRAM PC3200

$88.00

Samsung 160GB 7200RPM
IDE Model# SP1604N - OEM

$206.00

Creative Labs Sound Blaster
Audigy 2 ZS Platinum Pro

Monitors

$565.99

Samsung 910T-Black 19"
LCD Flat Panel SXGA 1280x1024

$869.99

Sony SDM-S204/B 20.1"
LCD Flat Panel UXGA 1600x1200

$239.99

ViewSonic G90FB 19"
PerfectFlat Screen CRT 1920x1440

Visit Newegg.com for today's prices and complete product line.

- *98% of orders ship within 1 business day*
- *100,000+ product reviews from customers*
- *12,000+ customer testimonials*
- *"A" rating on ANY merchant ranking site*

Free Shipping* >> *FedEx Express Saver Shipping*

Shoppers' Choice Award 2003
Best Place to Buy Components

©2004 Newegg.com Inc. All rights reserved. Newegg.com is not responsible for typographical errors. All typographical errors are subject to correction. All Items are sold as retail unless otherwise noted. OEM products may be sold without packaging, documentation or other articles. All prices and specifications are subject to change without notice. Prices do and will fluctuate dramatically due to the nature of the market. The listed prices were the current prices at the time this ad was submitted to the publisher on 9/7/04. *On These Advertised Specials.

Copyrighted material

MAXIMUM PC

EDITORIAL
George Jones EDITOR-IN-CHIEF
Katherine Stevenson MANAGING EDITOR
Gordon Mah **Ung** SENIOR EDITOR
Will **Smith** TECHNICAL EDITOR
Logan **Decker** FEATURES EDITOR
Josh **Norem** ASSOCIATE EDITOR
Andrew Sanchez EDITOR EMERITUS

ART
Natalie Jeday ART DIRECTOR
Boni Uzilevsky ASSOCIATE ART DIRECTOR
Mark Madeo PHOTO EDITOR
Samantha **Berg** ASSOCIATE PHOTOGRAPHER

CONTRIBUTING EDITORS
Tom Halfhill,
Thomas McDonald

CONTRIBUTING WRITERS
Bill O'Brien

PRODUCTION
Richard Lesovoy PRODUCTION DIRECTOR
Dan Mallory PRODUCTION COORDINATOR

ADVERTISING
Chris **Coelho** PUBLISHER
Bernard Lanigan EASTERN AD DIRECTOR
646.723.5405
Dave **Lynn** WESTERN AD DIRECTOR
949.360.4443
Stacey **Levy** WESTERN AD MANAGER
925.964.1205
Anthony **Danzi** EASTERN AD MANAGER
646.723.5453
Nate Hunt NATIONAL ACCT MANAGER
415.656.8536
Jose **Urrutia** ADVERTISING COORDINATOR
415.656.8313
Kathleen **Reilly** MARKETING MANAGER

CIRCULATION
Tina K. **Rogers** CIRCULATION DIRECTOR
Mimi **Hall** NEWSSTAND DIRECTOR
Angela Martinez FULFILLMENT MANAGER
Janet Amistoso DIRECT MARKETING SPECIALIST
Siara **Nazir** ASSISTANT BILLING AND RENEWAL SPECIALIST

BACK ISSUE REQUESTS
1.800.865.7240

REPRINTS PRINT AND DIGITAL
Reprint Management **Services**
Maggie **French**, 717.399.**1900 x178**
mfrench@reprintbuyer.com

How to contact us:
All subscription Inquiries 800.274.3421 or
maxcustserv@cdsfulfillment.com
Editorial staff input@maximumpc.com

future network usa

FUTURE NETWORK USA
150 North Hill Dr. Brisbane, CA 94005
415.468.4684 **www.futurenetworkusa.com**

Jonathan Simpson-Bint PRESIDENT
Tom Valentino VICE PRESIDENT/CFO
Charles Schug VP/GENERAL COUNSEL
Holly Klingel VP/CIRCULATION
Simon Whitcombe PUBLISHING DIRECTOR (GAMES)
Chris Coelho PUBLISHING DIRECTOR (TECH)
Steve Aaron PUBLISHING DIRECTOR (MUSIC)
Jon Phillips EDITORIAL DIRECTOR (TECH)
Brad Tolinski EDITORIAL DIRECTOR (MUSIC)
Nancy Durlester DIR. OF CENTRAL SERVICES
Richie Lesovoy PRODUCTION DIRECTOR

Future Network USA is part of **Future Network PLC**

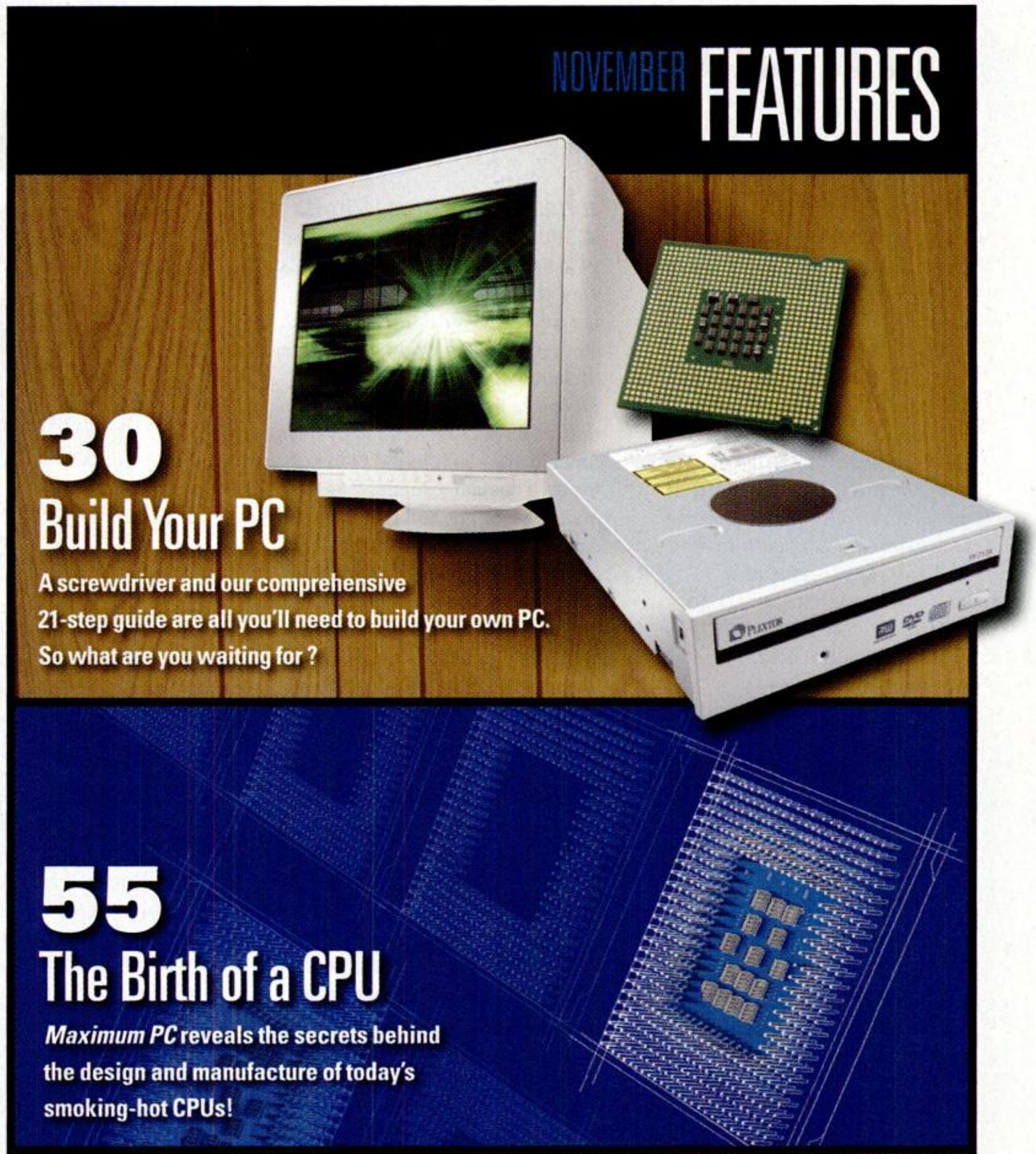
The Future Network produces carefully targeted special-interest magazines for people who share a passion. We aim to satisfy that passion by creating titles offering value for money, reliable information, smart buying advice and which are a pleasure to read. Today we publish more than 100 magazines in the US, UK, France and Italy. Over 100 international editions of our magazines are also published in 31 other countries across the world.

The Future Network plc is a public company quoted on the London Stock Exchange (symbol: FNET).

Roger Parry NON-EXECUTIVE CHAIRMAN
Greg Ingham CHIEF EXECUTIVE
John Bowman GROUP FINANCE DIRECTOR
TEL +441225 442244

Contents

NOVEMBER FEATURES



30
Build Your PC
A screwdriver and our comprehensive 21-step guide are all you'll need to build your own PC. So what are you waiting for ?

55
The Birth of a CPU
Maximum PC reveals the secrets behind the design and manufacture of today's smoking-hot CPUs!

49 PC Trauma Kit
Don't panic! With the essentials of our custom-made Trauma Kit, there's no PC disaster you can't handle.

In/Out

You write, we respond

UH, WHAT'S WRONG WITH TWO GIRLS KISSING?

You just had to go and include a review of a piece of trash—*Singles: Flirt Up Your Life*—in the October issue, and then to make matters worse, you included a screenshot of two women kissing. This stunt just goes to show me (and I'm sure a lot of other subscribers) that most, if not all, of the people at *Maximum PC* are a bunch of horny kids pretending to be mature adults. I won't go as far as to ask you to stop my subscription, but I won't be renewing either.

—CLINT GUILLORY

SHORTEST. QUESTION. EVER.

Just a simple question: What 24-bit/96kHz reference material do you listen to?

—MARTY

GORDON MAH UNG RESPONDS: AIX Records (www.aixrecords.com) has a nice sampling of high-resolution audio formats. The sampler disc that we use has DVD Audio on one side and 24/96kHz on the flip side.

FUD FOR THOUGHT

I was thumbing through my October issue and I saw the letter from Jake Campbell about the Centrino platform. First of all, Jake needs to lay off the espresso. As you guys replied, it's all semantics. But once I read your reply, it made me stop and think: not even Intel is immune to its own FUD (fear, uncertainty and doubt). AMD, ATI, nVidia—they all use it too. What makes this interesting is that Intel is the first company I've ever known to have shot themselves in the foot with the FUD bullet. I bet that stings. With this said, even as an avid AMD fan, I would be proud to own a laptop with the Pentium-M processor. It's one hell of a CPU.

—BEN PEARMAN

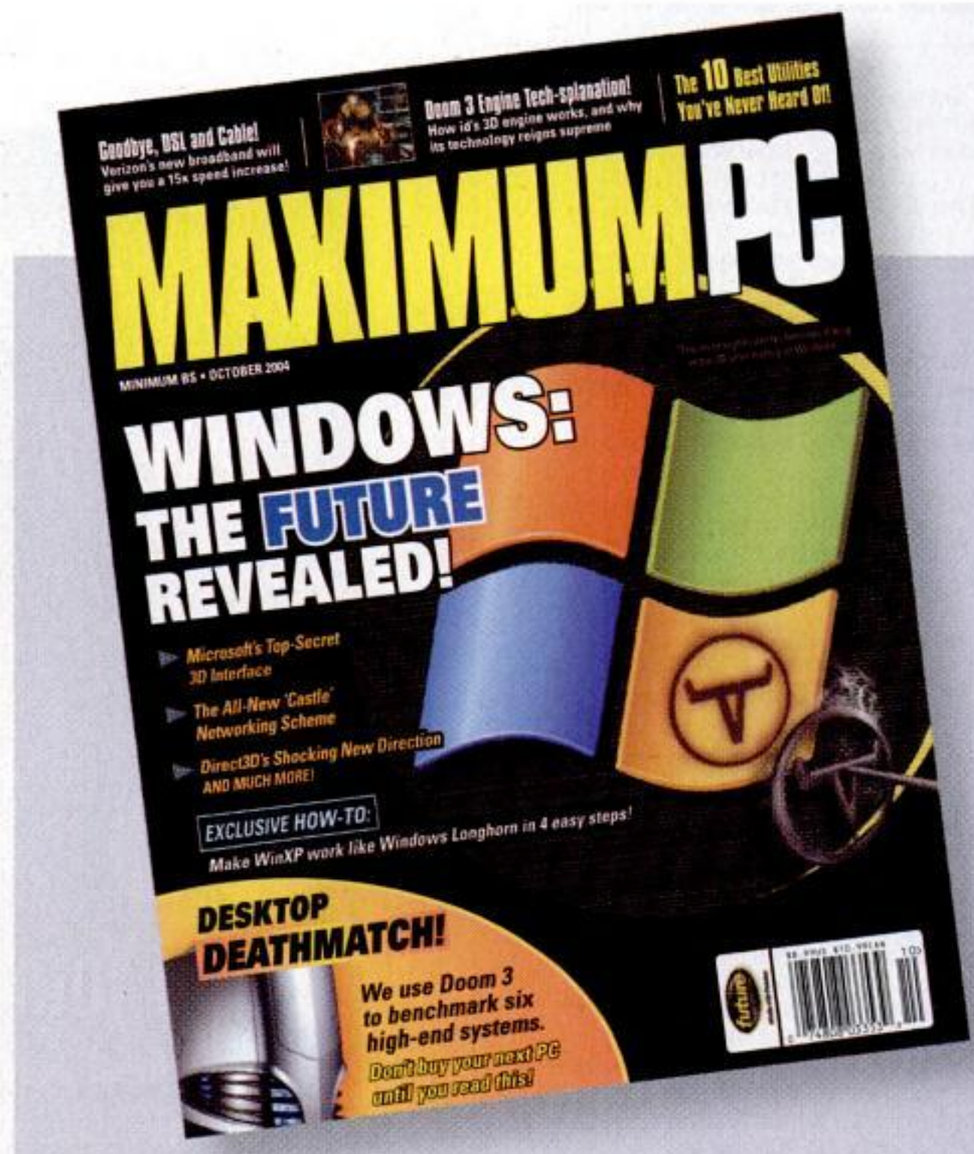
EDITOR IN CHIEF GEORGE JONES RESPONDS: You're right about the P4M being a hell of a CPU, Ben. By way of further explanation, FUD is a powerful and controversial marketing concept that rarely gets attention at the consumer level. Wikipedia.org gives a great definition: FUD was first defined by Gene Amdahl after he left IBM to found his own company, Amdahl, as the fear, uncertainty, and doubt that IBM sales people instill in the minds of potential customers who might be considering Amdahl products.

The FUD entry goes on to say that the premise was to persuade buyers to go with "safe" IBM gear rather than with competitors' equipment. This implicit coercion was traditionally accomplished by promising that Good Things would happen to people who stuck with IBM, and that Dark Shadows loomed over the future of competitors' equipment or software.

You could (and did) argue that Centrino embraces FUD tactics. Its message—that only the combination of the Pentium-M CPU, the 855 chipset, and Intel's own wireless chipset (despite the fact that we've heard OEM chipsets are no different) will provide what you're looking for—would seem to fall into the FUD category, given the implicit threat than non-Intel wireless chipsets are less reliable. Fair or not, I would argue that this has helped Intel more than hurt it. While some people have been confused by what Centrino is, lots and lots of mainstream consumers won't settle for anything else these days.

RECOVERING AMERICAN IDOL CD: PRICELESS

I recently lost most of my MP3 files and was trying to "re-rip" them from CD. I could only find one horribly scratched copy of Kelly Clarkson's performances on *American Idol*—which I recorded manually from the show. I was at a loss. But thanks to your suggestion in the August issue,



WHEN WILL YOU JUMP TO WINDOWS LONGHORN?

At the end of our October cover story ("Everything we know about Windows Longhorn"), we asked for your thoughts on Microsoft's next-gen Windows OS. Here's what you said:

Before I even got into the article, I wanted to e-mail ya'll to say I will gladly make the leap to Longhorn in 2006. I love the latest and greatest of anything for my PC and I can't wait for a new OS to try.

—BRAD

In the article, the editors gave their feedback as to what they would like to see in the next version of Windows. However, no one mentioned the complete uninstallation of applications. I couldn't possibly be the only one who has this concern. There are so many programs out there that make a half-hearted attempt at properly uninstalling apps that you would think this would be number one on everyone's list. All you should have to do is drop an icon into the Recycle Bin to completely remove the associated program.

—FRANK SUMMARIA JR.

After I read your article, I immediately changed my XP desktop into a Longhorn modification thanks to your provided links. From what you said, I'm not too excited about Longhorn. I love my PC, but it took a long time (by power user standards) to upgrade to XP. In fact, I bought Win2K after XP was released. I truly intend to wait and see more of what Longhorn has to offer. The DRM technology really has me running the other way. While I'm not a freeloading thief, I'm not a digital rights activist either. I hate Microsoft, the RIAA, and others treating everyone as if we're all thieves and need to be monitored like ex-cons.

—BOB COYNE

Copyrighted material

I used *Exact Audio Copy* and it worked perfectly.

—SCOTT

FEATURES EDITOR LOGAN DECKER RESPONDS: Scott, as hokey as it sounds, this kind of thing makes our day! Happy geeks are productive geeks. Considering that a priceless cultural artifact was restored to you, it seems appropriate to show the developer some love. So please write a check and drop it in the mail. Or pull a couple of singles out of your wallet and wrap them in a piece of paper and drop that in the mail. At the very least, send the developer a postcard with a note of appreciation. Do it for Kelly.

KEEP THIS ON THE DL

In the article "Desktop Deathmatch" (October 2004) you say that "dual-layer burners should be the standard spec for today's high-end machines." Isn't that a bit harsh as the standard for dual-layer drives hasn't been finalized? I believe they may still be fighting over whether or not the DL means "dual layer" or "double layer." Additionally, I believe you listed the Plextor PX-708A as your recommendation for a DL drive, but I couldn't find any information on Plextor's web site about the 708 being a DL drive. I wrote to Plextor about it, and they responded: "The standard for dual layering is not yet finalized, and therefore, none of the Plextor drives currently support the dual-layer discs." What's up? Have I missed something?

—MONTE CORBIT

LOGAN "DOUBLE" DECKER RESPONDS: First, we have no qualms about being harsh, when harshness is called for. Second, there is in fact a standard for double-layer burners (which almost all manufacturers are now calling "double layer")—it's called DVD+R DL. But Pioneer, wouldn't you know, has just released a competing standard under the DVD-R format. Plextor may be waiting to launch its own double-layer drive that includes single-layer burning at 16x, which is just on the horizon, or perhaps it will release a DVD-R DL drive instead, which is rumored to be introduced at 4x for double-layer burning, as opposed to the current 2.4x speed with DVD+R DL.

Regardless, being able to burn 8.5GB to a single double-layer disc is a great feature, and one that doesn't add much to the cost of a drive, so we still expect to see them in high-end PCs. →

PERFECTING THE ART OF DIGITAL MEDIA.

Roku proudly introduces two network-ready media players that set new standards in digital home entertainment.

The Roku SoundBridge Network Music Player plays your PC or Macintosh music files anywhere in the house. SoundBridge's super-bright display, sleek aluminum casing, and built-in Wi-Fi™ and iTunes® compatibility (along with support for all major music formats) make it a winning part of any home AV system.

The Roku HD1000 high-definition digital media player brings your high-def TV to life with digital photos, classic art and LiveArt,™ your entire music library — even DVDs you've saved to your computer. Just pop in a digital memory card, or easily connect with your Mac or PC.

Enhance your **entertainment experience** with a PC featuring
intel.com/go/digitalhome

Roku and Intel are working together to enhance your home entertainment experience.

For information and special offers, visit www.rokulabs.com/mpc

© 2004 Roku, LLC. ROKU, SoundBridge, LiveArt, and the ROKU logo are trademarks of Roku, LLC in the United States and other countries. iTunes is a registered trademark of Apple, Inc.

Copyrighted material

COMING NEXT MONTH

IN THE HOLY-SMOKES-HOW-CAN-IT-BE-WINTER-ALREADY? DECEMBER ISSUE OF MAXIMUM PC

GEAR OF THE YEAR

Each year, we rate and review more than 500 products. Each December, we laud the very best. Next month, we'll award our coveted Gear of the Year award to the winners. Don't miss it!

MAXIMUM PC GIFT GUIDE

As you read these words, *Maximum PC's* editors are torture-testing the most promising new gadgets, devices, doodads, and doohickeys of the holiday season.

MEDIA CENTER PC SHOOTOUT

But weren't they supposed to be in this issue? Yes, they were, but the pending release of Microsoft's new Media Center 2005 OS made us hold off a month. Next month, we'll give you the scoop.

Also:

Straight-talking reviews: speakers, case enclosures, videocards, 20-plus-inch LCDs... and a boatload of game reviews, including *Madden 2005, Rome: Total War,* and (hopefully) *Half-Life 2.*

Finally, the Plextor PX-708A is a single-layer drive, not double-layer. I can't remember *Maximum PC* ever calling it a DL drive, but if we did, we apologize.

DEFRAGGIN' DA RAID?

Your Windows XP special issue ("Master WinXP!," Summer 2004) frequently mentions defragging. You also frequently mention the benefits of RAID. Fine, but how do you defrag RAID? When I try to do it, my defragger won't allow me to. And I haven't been able to find a utility to do it, either. Is it even possible?

—BRIAN HOAG

ASSOCIATE EDITOR JOSH NOREM RESPONDS:

Defragging a RAID array is no different than defragging a single drive, so there really isn't anything complex about the situation. Because the array appears to the OS as a single drive, your software should see it as such. If the software can't access the array, there may be a problem with your drives. You might want to try clicking Start Menu, Run, and typing "chkdsk" without the quotes. Assuming your drives are fine, we're wondering if you have the correct drivers for your RAID controller, the latest drivers for your motherboard chipset, and the latest BIOS for your motherboard. You also might want to download the diagnostic utility for your hard drives from the manufacturer's web site to see if the drives are in good working order. Without knowing your system specs, it's a crapshoot, but we'd start with the basic steps described above.

YOU FORGOT ABOUT GAPLESS PLAYBACK

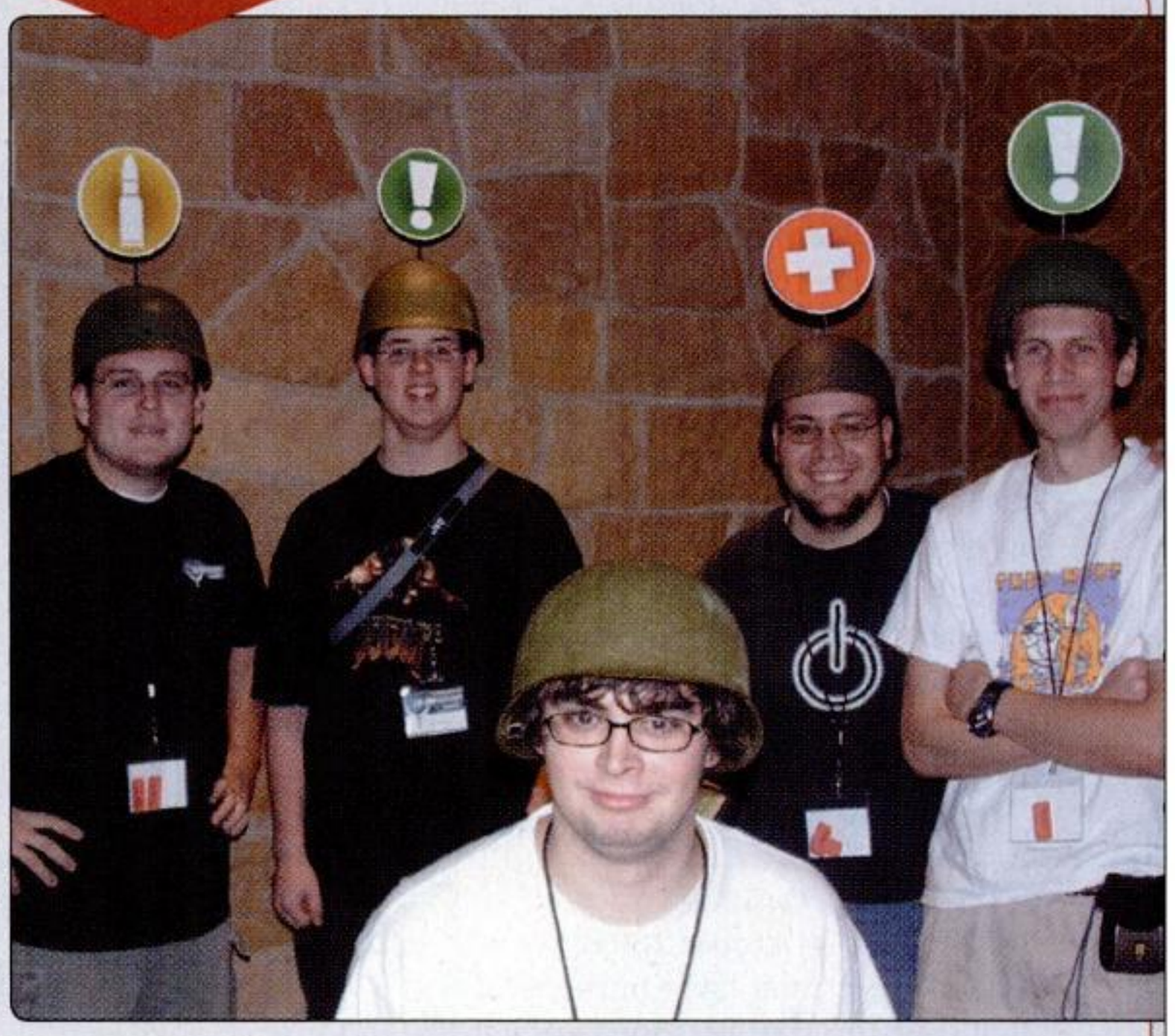
One thing you failed to point out concerning the Rio Karma (September 2004, "Can Anyone Beat the iPod?") is the gapless playback feature. Try listening to a live album on both the Karma and the iPod and tell me which one you prefer.

—DAVID BJORGEN

FEATURES EDITOR LOGAN DECKER RESPONDS:

Good point, David. One reason we neglected that feature is because a number of us here actually make a single continuous MP3 out of live performances—thereby avoiding any gaps—and then use the iPod's awesome wheel-scanning function (where you press the center button, and then visually scoot across the track with the scroll wheel) to move through it. But, indeed, gapless playback (which doesn't insert dead space between tracks) is yet another nice feature of the Karma.

One final note: We're currently sworn to secrecy, but keep your eyes open in our December or January issue for some really cool new stuff from Rio! ■



QUAKECON 2004 = TRUE GAMERS

I saw these guys at Quakecon and thought, if anybody deserves to get their picture in a magazine as the epitome of true gamers, it's them. What do you say? My buddy Randy James took the picture.

—RICHARD SAN MARTINA

EDITOR IN CHIEF GEORGE JONES RESPONDS: We quote the book of Lil' John and say "YEAH!" Thanks, Richard.

LETTERS POLICY: ***MAXIMUM PC*** invites your thoughts and comments. Send them to **input@maximumpc.com**. Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

CUT, COPY, PASTE

➤ In the October issue, we goofed on two URLs. *RSS Bandit's* URL (p. 52) is actually www.rssbandit.org. And the URL for *WindowsBlinds* (p. 37) is www.windowblinds.net.

➤ In September's "Case Studies" feature, we listed the price of Chenbro Xpider II as $55, when in fact it's $90. We also wrote that the Cooler Master Centurion and CMStacker cases were all-aluminum, but both cases feature aluminum front bezels with a steel chassis.

➤ And, in what is probably a first for *Maximum PC*, we're reporting on an error in this very issue. On page 82 our review of the Logitech Z-5500 Digital fails to include the set's remote control, which didn't make it to photography in time. Now that's honesty for you!

Copyrighted material

FULL SPECTRUM WARRIOR™

"★★★★★"
– MAXIM

"Top 10 Games of 2004"
– PC GAMER

"Overall, Full Spectrum Warrior is perhaps the most realistic military game ever made."
– GAME INFORMER

"Redefining both the war and strategy genres."
– OFFICIAL XBOX MAGAZINE

"Oh-My-God Experience. Full Spectrum Warrior is an amazing achievement in design."
– IGN.com

IGN.COM EDITORS' CHOICE award

"RIVETING & ENGROSSING."
– GAMESPY

Command two fire teams in strategic squad-based combat

Team up with a friend online for 2 player co-op

AVAILABLE NOW ON PC & XBOX

TAKE COMMAND

WWW.FULLSPECTRUMWARRIOR.COM

MATURE 17+
CONTENT RATED BY ESRB
Blood
Strong Language
Violence

SOUNDS BEST ON Sound BLASTER 24-bit

PC CD-ROM SOFTWARE

XBOX LIVE ONLINE ENABLED

PANDEMIC
www.pandemicstudios.com

THQ
www.thq.com

© 2004 Pandemic Studios, LLC. All Rights Reserved. Pandemic ®, the Pandemic logo ® and Full Spectrum Warrior TM are trademarks and/or registered trademarks of Pandemic Studios, LLC and are reproduced under license only. Exclusively licensed by THQ Inc. THQ and the THQ logo are trademarks and/or registered trademarks of THQ Inc. All rights reserved. Microsoft, Xbox, *Xbox Live*, the *Live* logos and the Xbox logo are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries and are used under license from Microsoft. The ratings icon is a registered trademark of the Entertainment Software Association. PC CD-ROM Logo © and TM IEMA 2003. All other trademarks, logos and copyrights are the property of their respective owners.

JOIN THE RANKS OF MILLIONS AND PREPARE
TO TAKE SIEGE ON A NEW WORLD.

Copyrighted material

WHERE ADVENTURE COMES ALIVE™

SONY PICTURES ENTERTAINMENT PRESENTS A SONY ONLINE ENTERTAINMENT GAME
STARRING YOURSELF ANTONIA BAYLE LUCAN D'LERE AND THOUSANDS OF OTHER PLAYERS
MUSIC BY LAURA KARPMAN DIRECTOR OF PHOTOGRAPHY YOU FEATURING THE QUEST OF A LIFETIME

TEEN
T
Suggestive Themes
Use of Alcohol
Violence
ESRB CONTENT RATING www.esrb.org
Game Experience May Change During Online Play

AVAILABLE ON:
PC DVD-ROM SOFTWARE
PC CD-ROM SOFTWARE

WWW.EVERQUEST2.COM

The way it's meant to be played
NVIDIA

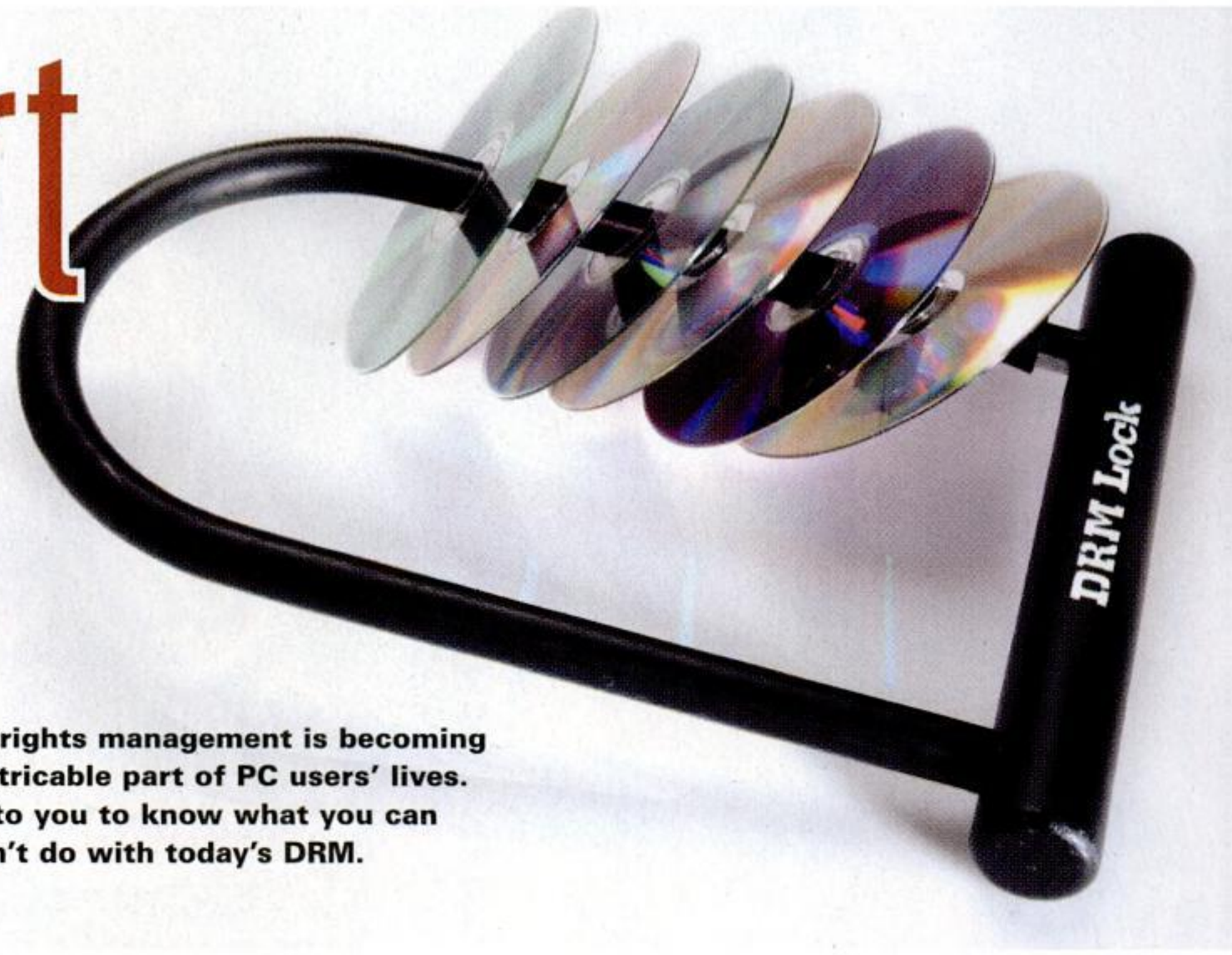
SOE
SONY ONLINE ENTERTAINMENT

© 2004 Sony Computer Entertainment America Inc. EverQuest is a registered trademark of Sony Computer Entertainment America Inc. SOE and the SOE logo are registered trademarks of Sony Online Entertainment Inc. All rights reserved. All other trademarks or trade names are properties of their respective owners. The NVIDIA logo and the "The way it's meant to be played" logo are registered trademarks or trademarks of NVIDIA Corporation. © 2004. The ratings icon is a trademark of the Entertainment Software Association.
"Where Adventure Comes Alive" is a trademark of Sony Computer Entertainment America Inc. The software platform logo (TM and © IEMA) 2004. The ratings icon is a trademark of the Entertainment Software Association.

Copyrighted material

QuickStart

The beginning of the magazine, where articles are small



Digital rights management is becoming an inextricable part of PC users' lives. It's up to you to know what you can and can't do with today's DRM.

Deciphering Digital Rights Management

Like it or not, DRM impacts all of our lives. *Maximum PC* investigates how the 5 most popular DRM schemes work—and the problems they cause

Even the mighty lobbies of the entertainment and software industries are no match for the popularity of broadband and the resilience of peer-to-peer networks. With this in mind, we expect to see more digital rights management, or DRM, incorporated into everything from online music purchases to store-bought games to hardware gadgets and other playback devices. In this first overview of applied DRM, *Maximum PC* unveils the mechanics behind today's digital rent-a-cops—and the problems they're most likely to cause.

iTunes won't let me play tracks that I haven't acquired licenses for—but I bought them!

PERPETRATOR: FAIRPLAY

If you've "installed" licenses on more than three PCs, or if you recently performed a clean installation of Windows and are trying to play iTunes tracks, FairPlay steps in and says: "Oh no you don't." That's because every time you buy a FairPlay-encrypted MP4 track, a random user key is generated and stored on Apple's servers and in your iTunes database. This key is used by iTunes to receive and decrypt the master key (which is retrieved from Apple's servers) necessary to play the embedded AAC file. Apple's servers will authorize up to three PCs to receive their own unique user key. After that, further requests are refused unless one of your PCs is de-authorized, thereby revoking its user key.

WARNING: No other portable player besides Apple's own iPod is authorized to play FairPlay-protected content.

I copy DVD-Video files to my laptop's hard drive!

PERPETRATOR: CSS

That's because the files, including crucial data headers, are encrypted. In order to decrypt them, your DVD-ROM and your hardware or software player have to prove to each other that they're licensed to access the files. They do this by generating a random number and then encrypting this number by using a secret mathematical formula that converts the number into an 80-bit string (or "hash"). The DVD-ROM and the player hardware/software exchange these values over the system bus, and if both return values that agree with the formula, then the player—again, hardware or software—uses a player key (assigned from a master list of 409 keys) to unlock a disc key on the DVD itself. The disc key, in turn, allows the player to retrieve the rest of the keys that unlock the disc's contents. If you try to simply copy the files, they remain encrypted and irretrievable because your PC has none of the keys required to unlock, or even locate, most of the content.

WARNING: Using decryption tools such as *AnyDVD* or *DVDDecrypter* is illegal under the Digital Millennium Copyright Act.

I can't play purchased WMAs on my favorite media player!

PERPETRATOR: WINDOWS MEDIA DRM

Windows Media DRM works pretty much just like Apple's FairPlay. Centralized servers dish out "licenses" and keep track of which PCs are authorized to play protected media. One of the nice things about Windows Media DRM, as opposed to FairPlay, is that Microsoft is willing to license the technology to other companies so you don't have to use *Windows Media Player* to listen to your music or transfer your tracks to a portable device. However, it's important that you *be certain your portable player supports Windows Media DRM before you purchase protected WMAs.*

WARNING: Because Windows Media DRM licensing allows retailers to set their own usage policies, usage permissions may differ from one site to another, and individual song permissions can vary within the same site!

I can't play a purchased CD on my PC!

PERPETRATOR: KEY2AUDIO

Key2Audio is Sony's proprietary copy protection technology, and works by inserting a track onto the disc which, in effect, confuses PCs with a bogus table of contents. It became something of a laughingstock, however, when it was revealed the technology could be defeated by using a black Sharpie pen to outline the outer edge of a protected CD, effectively wiping out the area where the bogus track is stored. Although used mostly on European music CDs, this form of audio CD protection is creeping into the U.S.

Copyrighted material

WARNING: Key2Audio has been known to cause Macs—and sometimes PCs—to crash, a fact that even Sony acknowledges. D'oh!

My game won't launch because I've got a virtual drive installed!

PERPETRATOR: SAFEDISC

SafeDisc, the most popular type of copy protection for PC games, isn't just a single technology—it's a bundle of them that are constantly being updated, modified, and enhanced with newer technology, playing a leap-frog game with aggressive pirates as they crack each successive version. This means that how it works is a closely guarded secret that is routinely made obsolete. But we do know that SafeDisc-protected games scan your PC for evidence of virtual drives, which are used by some miscreants to mount pirated disc images downloaded from the net.

WARNING: SafeDisc now also includes "SilentAlarm" technology. Previously called "Fade," SilentAlarm detects alterations to game code that could represent hacking, and consequently degrades the gameplay so guns no longer aim correctly and cars gradually deteriorate until they drive like 20-year-old Yugos. Brilliant!

AMD's and Intel's Dueling Dual CPUs

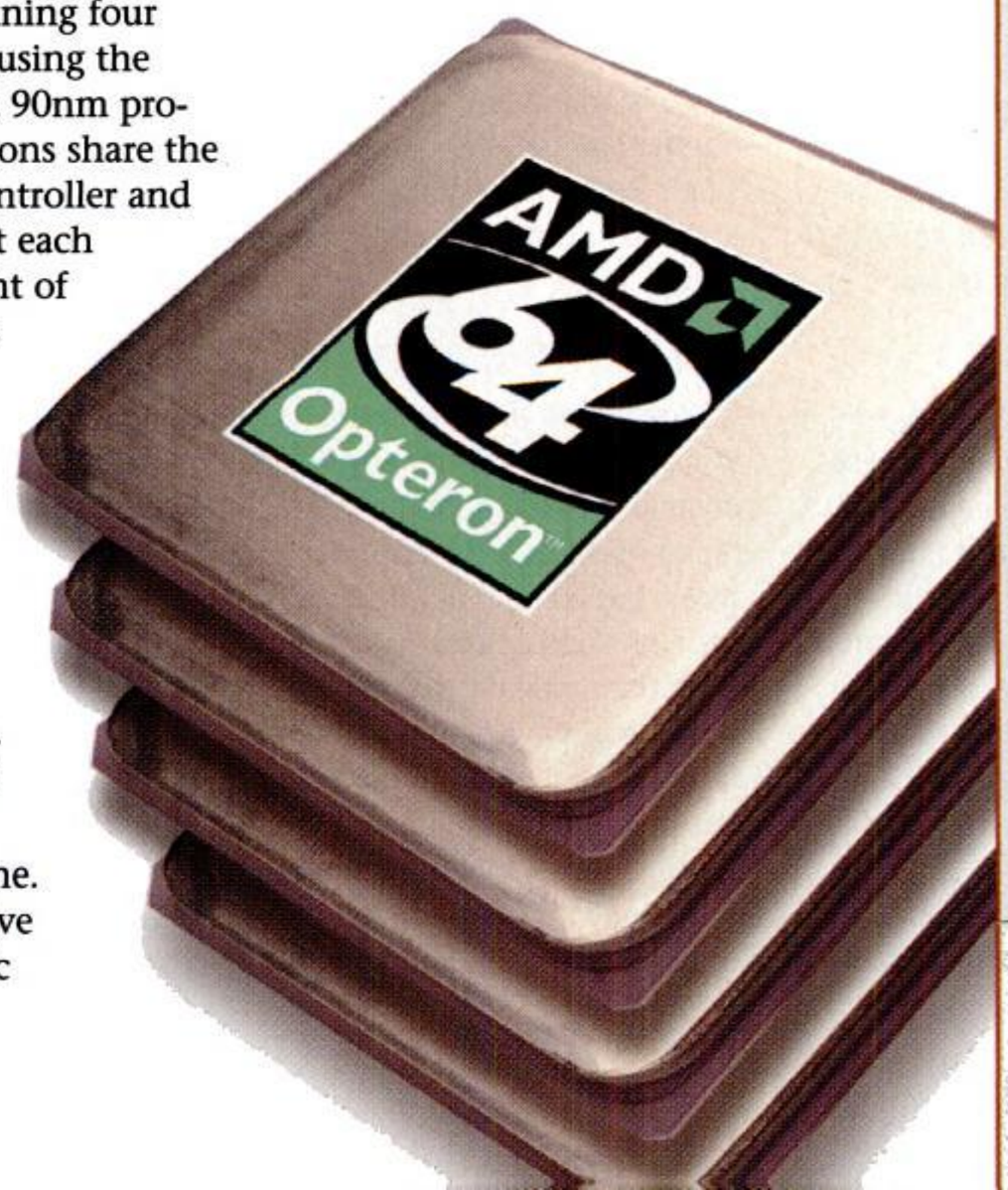
Both chipmakers show off dual-core platforms

Dual-core systems are expected to be the next badge of high-level PC performance as both AMD and Intel search for ways to exploit shrinking circuits while keeping power consumption and heat under control. Instead of building processors with single computing cores that run at 10GHz, the goal is to build CPUs with two independent cores running at 5GHz, or four cores running at 3GHz.

AMD first slapped Intel's face by showing off a system running four dual-core Opteron CPUs using the company's newly minted 90nm process. The dual-core Opterons share the chip's on-die memory controller and HyperTransport links, but each core has its own allotment of 1MB L2 cache. AMD says that when introduced next year, the dual-cores will drop into existing Socket 940 server and workstation motherboards provided the motherboards support 90nm processors.

A week later, an indignant Intel struck back by showing off a dual-core processor desktop machine. Intel was far more secretive than AMD on the specific features of the CPU, but did say the chip was running on the 915 chipset, which implies that the new chip is based on Prescott. Many speculated that Intel's first dual-core CPUs would be based on the Pentium M core. Both companies expect to face off with dual-core CPUs in 2005.

AMD says "four is more." We agree.



FAST FORWARD BY TOM R. HALFHILL

Why WiMax?

Just when you thought your Wi-Fi notebook computer or wireless home network was cutting-edge technology, along comes something new, threatening to make it obsolete. The Next Big Thing on the hype cycle is WiMax.

WiMax is the friendly marketing name for wireless broadband networking based on the IEEE 802.16 standard, much as Wi-Fi and Wireless-G are marketing names for broadband wireless networking based on IEEE 802.11b/g. WiMax has been kicking around in standards committees for three years, but it's getting more attention now because Intel and other major companies are supporting it with real products. Intel recently announced a new WiMax chip code-named Rosedale that could cut the cost of WiMax transceivers in half.

Some pundits are touting WiMax as a replacement for Wi-Fi, DSL, cable modems, residual dial-up connections, and the use of third-generation (3G) cell-phone networks for data traffic. Of course, anything new is hyped to the hilt at first. Usually, the optimistic forecasts grow more realistic in the face of technical obstacles, market resistance, or hidden costs. So it will go with WiMax.

One technical obstacle is radio-frequency spectrum. WiMax is scattered all over the ether, from the 2.5GHz and 3.5GHz licensed bands to some unlicensed bands at 5.8GHz and higher. Higher-frequency spectrum is more readily available, but the signals have less range and penetration. In the higher bands, WiMax signals may reach only a mile or so and penetrate only one wall of a building, which limits its usefulness as a wired network replacement in crowded cities. Still, a one-mile radius is much bigger than a Wi-Fi hotspot.

Spectrum reallocation could significantly boost WiMax's popularity. WiMax backers are casting hungry eyes on sub-1GHz frequencies, like the 700MHz band, where the transition to digital TV could free up some of the UHF-TV spectrum. At 700MHz, WiMax could reach 30 miles or more, and deep into buildings, making it a serious contender for metropolitan-area wireless broadband. To reach anywhere near that range and depth now, WiMax data rates would likely plunge to much slower rates than Wi-Fi's.

Market resistance could come from Wi-Fi users who shun a new wireless standard, but cost cutting could overcome the heebie-jeebies. Eventually, a single chip could integrate both WiMax and Wi-Fi, allowing users to access either network. But that's years away. Although Intel says its Rosedale chip will slash the cost of a WiMax transceiver in half, the cost is still upwards of $200. WiMax looks promising, but existing standards are safe for the time being.

Tom Halfhill was formerly a senior editor for Byte *magazine and now an analyst for* Microprocessor Report.

Copyrighted material

Peace and Quiet in PC-ville

A Utah physicist cancels PC noise with weird science

PC power users go to some wacky lengths to squelch the noise of a handful of case fans humming in unison, but often these efforts simply trade one problem for another. Acoustic padding can heat up your PCs interior. Fan cards hog a PCI slot. Ear muffs look ridiculous. And don't even get us started on the hazards of a water-cooling kit gone awry.

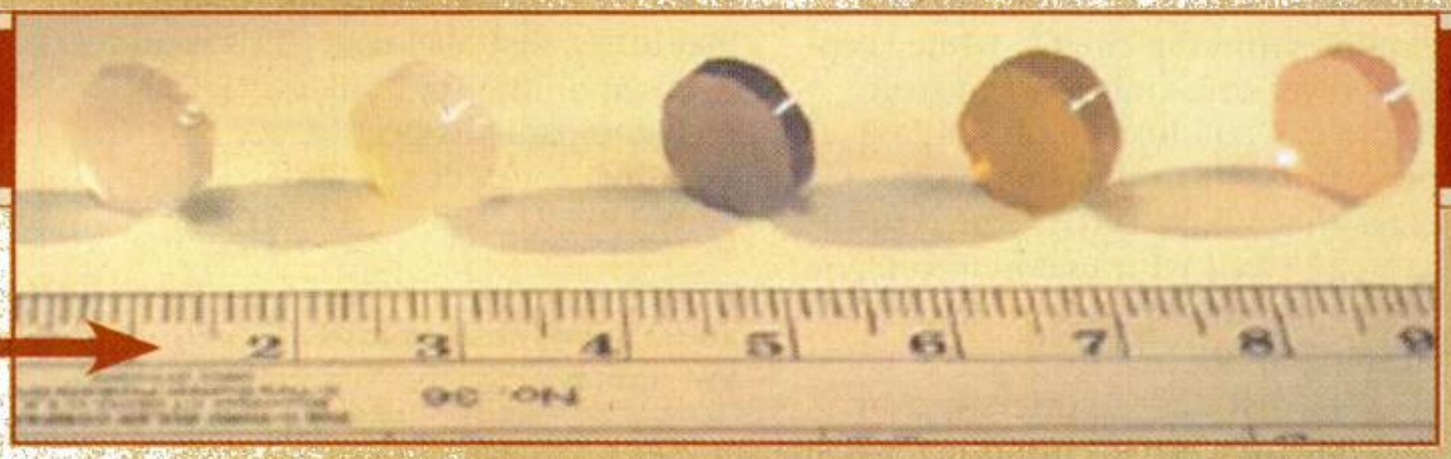
Scott Sommerfeldt, a physics professor at Brigham Young University in Utah, may have the answer we've been looking for, and strangely enough, it's more noise. The noise suppression system he developed with graduate student Kent Gee uses four tiny speakers to generate sound waves that cancel out the frequencies generated by case fans. Sommerfeldt likens the reduction in fan noise to "going from soft talking to a low whisper."

While noise cancellation (also known as active noise control) isn't a new idea, as anyone who's worn a pair of noise-canceling headphones already knows, it's expensive technology. Sommerfeldt's noise suppressor, on the other hand, was put together with readily available parts for about $20, making it practical for manufacturers to implement in their case designs.

Sommerfeldt and Gee have filed for a patent on the system, and they hope that soon, light-sleeping case modders everywhere will be able to buy an inexpensive noise suppression kit and finally get a good night's sleep.

By creating fluctuations in air pressure equal and opposite to those created by the noise of a whirring fan, tiny speakers put the kibosh on PC case noise.

FUN-SIZE NEWS



THE ENTERPRISE HAS LANDED

It may not convince skeptics, but this evidence satisfies our belief that beings from a utopian society in the far-flung future have visited Planet Earth. 3M labs in Minnesota recently announced a "flame-spray" technique that produces transparent alloys from aluminum oxides. That's right—transparent aluminum is here, just as predicted in the 1986 film *Star Trek IV: The Voyage Home*. *Maximum PC* staff are scouring the greens of San Francisco's Golden Gate Park for telltale signs of space shuttle depressions.

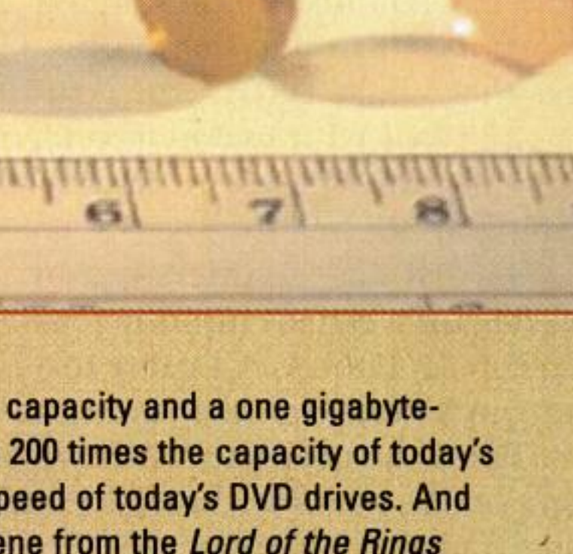
WINFS 86'D

In our October 2004 Longhorn preview, *Maximum PC* sang the praises of WinFS, the next-generation file system that would enable much faster searching and data retrieval by maintaining directories in a relational database. Imagine our heartbreak when Microsoft subsequently announced that it was dropping WinFS from the initial launch of Longhorn in order to make the new Windows' already-delayed launch projection of 2006. It may, however, be made available later as a free update. We'll keep you updated as our insiders feed us the latest from Redmond.

COMING SOON TO A HOME THEATER NEAR YOU

Optware Corp. announced a working proof-of-concept holographic recording disc, known as the Collinear Holographic Data Storage System, with one terabyte of storage capacity and a one gigabyte-per-second transfer speed. That'd be 200 times the capacity of today's single-layer DVDs and 40 times the speed of today's DVD drives. And just enough to hold every deleted scene from the *Lord of the Rings* trilogy.

LOST IN TRANSLATION



It's inevitable that the world's largest software company should commit a social gaffe or two translating its software for various cultures, but leave it to Microsoft to err with such spectacular aplomb. First, the company lost millions in revenue when Windows XP was recalled by the Indian government because the OS included a graphic establishing disputed Kashmir as an independent territory. More recently, a translation boo-boo prompted Spanish language users to select a gender of "male" or "bitch."

CALL OF DUTY™
UNITED OFFENSIVE™
EXPANSION PACK

"FEELS LIKE THE BEST OF BATTLEFIELD 1942 AND CALL OF DUTY COMBINED."
–GameSpy

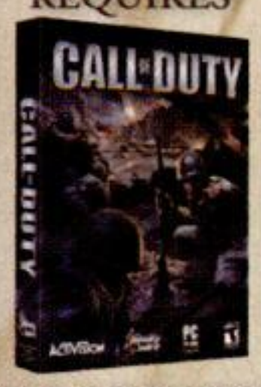
13 new single-player missions, as seen through the eyes of American, British and Russian soldiers.

New weapons, including flamethrowers, deployable machine guns, and the ability to call in artillery strikes.

11 new multiplayer maps and 3 new modes, with vehicle combat including tanks and jeeps!

EXPANSION PACK TO THE 2003 GAME OF THE YEAR

REQUIRES



CALL OF DUTY™ TO PLAY

TEEN T CONTENT RATED BY ESRB
Blood
Mild Language
Violence

gray matter studios

PC CD-ROM SOFTWARE

Developers of Call of Duty™
infinity ward

WWW.CALLOFDUTY.COM

ACTIVISION.

© 2003-2004 Activision, Inc. Activision is a registered trademark and Call of Duty and Call of Duty: United Offensive are trademarks of Activision, Inc. All rights reserved. Developed by Gray Matter Interactive, Inc. This product contains software technology licensed from Id Software ("Id Technology"). Id Technology © 1999-2000 Id Software, Inc. The ratings icon is a registered trademark of the Entertainment Software Association. PC CD-ROM logo © and TM IEMA 2003. All other trademarks and trade names are the properties of their respective owners.

activision.com

GAME THEORY BY THOMAS L. McDONALD

The Annual Year-End Binge n' Purge

Every year around this time I emerge from my spider-hole, having just spent a month with almost every video and computer game that I can get my hands on, and shout "Don't shoot, I am the President of Iraq."

Actually, I usually just murmur "mommy" and collapse into a heap of Zatoichi DVDs for a week. The end of summer marks the end of the holiday issue season for most magazine editors, and as editor-at-large for the old-school puzzle/gaming magazine *Games*, I have to produce a guide to the top 100 PC and video games of the past year, which means I have to look at a goodly chunk of everything released over the past year. Frankly, either my brain has gone soft or the quality of games is generally improving, because this is nowhere near the painful task it used to be, when bad games were the rule. More likely it's a sign that the art of electronic game design is maturing. Sure, for every one *Far Cry* there is still one *Catwoman*—but there used to be two. This is progress.

One thing has not changed over the past few years, however, and that is the slow but undeniable downward arc of PC gaming. As the quality of titles increases, the number decreases, which is frankly not that bad a development. Ten good games are certainly better than 20 mediocre ones. Numbers do tell a tale, though. On my list this year, there were 40 PC games, with 25 of these being exclusive to PC, and 14 of those 25 being strategy games, a genre where the PC always has and always will remain dominant.

No, this does not mean the sky is falling or that PC gaming is dying. Not at all. As proof, in my Top 100 list, which spanned all platforms, I named *City of Heroes* as the best game of the year, *Far Cry* as the best action game, and *Rome: Total War* best strategy game. (For the first time in a long time the RPG title went to a console game: *Fable* for Xbox.) *City of Heroes* earned its bones based on the sheer joy that it exists and plays as well as it does. *Far Cry* and *Rome* are, in fact, better examples of pure and perfect design in their categories, but, flaws and all, *City of Heroes* spans categories and does it with immense skill—the difference between the best action or strategy game and the best overall game.

What this annual survey tells me is that PC gaming is neither dying nor thriving, but settling into a mature and comfortable niche. This year was the sushi of PC gaming: There hasn't been much on the plate, but it sure is fine.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Upgrade Your Wi-Fi Router

Turn your plain-Jane Linksys box into a super-router with one of these third-party firmware upgrades

Did you know that many inexpensive Linux-based routers—like the Linksys WRT54GS pictured here—can use third-party firmware, which add loads of exciting new features?

Sure, you could hope your router manufacturer will release new firmware that might upgrade the hardware with added functionality. But waiting is for chumps—especially if you own a Linksys router. The Linux-based OS used in the Linksys routers has proved irresistible to some power-users, who have released custom firmware that adds new features and functions to the otherwise buttoned-down boxes.

Before we tell you what the coolest hacks do and where to get them, you should know a couple things about flashing your firmware. First, the documentation for these unauthorized firmware upgrades ranges from nearly undetectable to never existed, so if you can't figure out how to install the firmware, well, you probably shouldn't even be trying. Second, using a third-party firmware will void your warranty and could render your router unworkable. One more time—*using a third-party firmware will void your warranty and could render your router unworkable.*

These three hacks all work with the Linksys WRT54G series of routers. If you have another Linux-based router, spend some quality time with Google to see if there is third-party firmware for your hardware.

SVEASOFT

Sveasoft charges for its firmware, and doesn't even make it very easy to buy, but it's tough to find another third-party firmware that's this comprehensive. This upgrade bulks up the firewall and adds a static DNS, which lets you route connections from the Internet to multiple machines on your internal network. But our favorite addition is called "bandwidth shaping." If your roommate is hogging all the bandwidth downloading *Reno 911* off Bittorrent, you can cut him off by putting limits on specific users or applications.

You have to register on the Sveasoft forums before you can purchase the firmware. Go to **www.sveasoft.com**, click Firmware under the Links column to the far left, and then click Register at the top of the subsequent page underneath "Sveasoft Forums." A full year of firmware upgrades costs $20.

WIFIBOX

Static DNS is even more fun when it's free, so if that's all you need, skip Sveasoft's wacky registration process and get WiFiBox instead. Remember, Static DNS lets you assign each computer on your network a name, which external users can then use to access more than one machine on a single IP address. To try out this firmware, go to the Sourceforge Download page (**http://wifi-box.sourceforge.net/**), and grab the latest version under the WRT54G firmware heading.

OPENWRT

OpenWRT is more ambitious and flexible than WiFiBox. It offers a basic level of functionality to make a network work, then gives you access to a system that lets you add new functionality via packages you download from the net. These packages add everything from bandwidth shaping to Static DNS routing. You can even specify quality of service settings for time-critical applications—like VoIP phone calls. Heck, using the Kismet package, you can even turn your WRT54G into a Wi-Fi sniffer! It's a crazy world. Find out just how crazy at **www.openwrt.org**.

Copyrighted material

TechnoFile

Quick takes on technology trends

Sony Clie PEG-VZ90

Say *sayonara* to the stodgy personal digital assistants of yesterday, and get an eyeful of the handheld that entertains even as it helps you tame your day. Not just another sexy siren in the Clie harem, Sony's PEG-VZ90 handheld represents a much-needed rethinking of the PDA.

Transfer a movie onto your CompactFlash card, and pop it into the Clie for a painless afternoon in the cubicle. Its roomy 3.8-inch display rivals the screen real estate of today's portable media players, but the underlying technology instantly shames the competition. Sony is ditching a traditional TFT (thin film transistor) display in favor of OLED (organic light-emitting diode) technology, which dishes out razor-sharp images at a 1,000:1 contrast ratio, resulting in richer blacks and better overall color fidelity that you can see in broad daylight. And OLED displays don't require backlighting, so the PEG-VZ90 consumes a fraction of the power required by crusty old TFT screens. Sony estimates four to 12 hours of continuous video playback on the PEG-VZ90, depending on the brightness setting.

When the boss shows up, simply slide the screen upwards and you'll look hyper-productive poking at the Palm-based PDA with a 123MHz ARM processor, 192MB of RAM, and embedded Wi-Fi (can you say "streaming media"?).

Sony bailed from the handheld market here in the US, so, tragically, the Clie is available only in Japan for the time being. But if you thought PDAs were dying or dead—and we're certainly guilty of entertaining the notion—think again. The Clie PEG-VZ90 indicates that the age of the handheld may have only just begun. Now if only it had an integrated phone...

With a mind-blowing 1,000:1 contrast ratio and a wider color gamut than traditional displays, you may find yourself opting for the small screen on your next movie date.

Newegg.com

http://www.newe

SONY

$1675.00

VAIO VGN-A130B3
Pentium M 1.5GHz 15" XGA TFT
512MB RAM

Canon

$1499.00

EOS 20D
8.2 MegaPixel Digital Camera
with EF-S 18-55mm Lens

ViewSonic

$2499.00

VP230MB
23.1" LCD Monitor with Speakers

acer

$799.00

TravelMate TM244LC
Mobile Celeron 2.6GHz 15" XGA TFT
256MB RAM

SONY

$899.00

Cyber-shot® DSC-F828
8 MegaPixel 7x Optical 2x Digital Zoom

SimpleTech

$375.00

400GB USB 2.0/FireWire
External Hard Drive
Model# STI-USB235/400 OEM

FREE SHIPPING*
FedEx Express Saver Shipping

Copyrighted material

THIS MAGAZINE ALSO MAKES A HANDY CATALOG.

We don't print a catalog. But anything devoted to computers makes for great shopping. Even our competitors' catalogs, stores and web sites. We believe the more you know, the better we look. So shop around. Then, when you know exactly what you want, buy it at Newegg.com. Great prices. Fast shipping. And just about everything you see in this magazine, in stock.

newegg.com™

ONCE YOU KNOW, YOU NEWEGG.

an "A" rating on every merchant ranking site.

BizRate

©2004 Newegg.com. All rights reserved. Newegg.com is not liable for misprints. Errors are subject to correction. Items sold at retail unless otherwise noted. Prices and specifications subject to change without notice. Listed prices were current at time this ad was submitted to publisher. *On These Advertised Specials.

Copyrighted material

Head2Head

A showdown among natural PC competitors

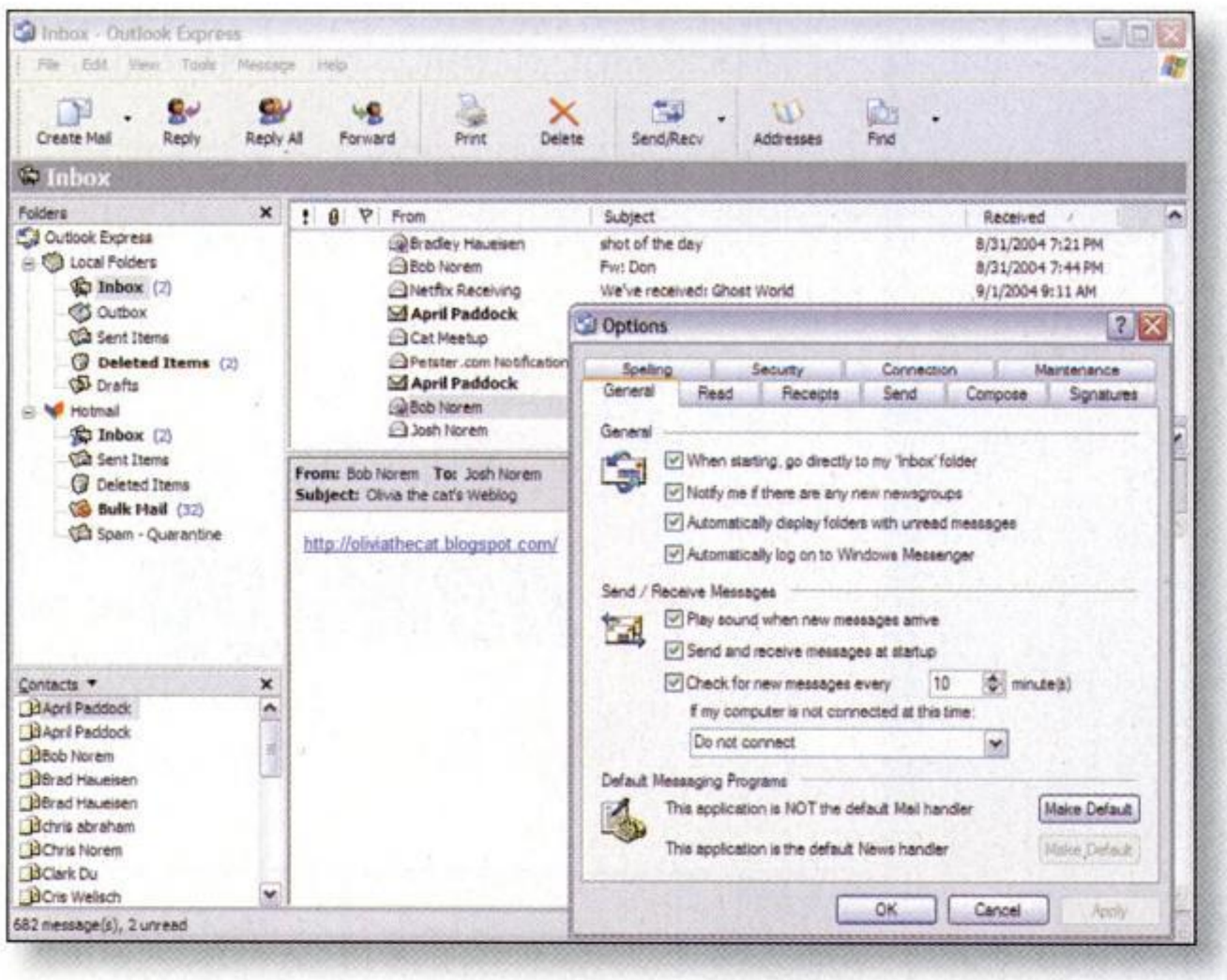
THIS MONTH: Free E-Mail Clients!

Everyday across America, unemployed riff-raff stumble into their local liquor stores, stare at the selection of refrigerated beverages and face a choice—Old English 800 malt liquor (aka OE) or Thunderbird fortified wine? This month in the Maximum PC Lab we're also forced to decide between Thunderbird and OE—the difference is, we're talking e-mail clients, not cheap booze. *Microsoft's Outlook Express (or OE)* and Mozilla's *Thunderbird* are currently the two most popular and widely used e-mail clients, and both are completely free. But which one should you use? Watch in slack-jawed awe as we put each app to the test and declare once and for all which e-mail client you should use.

—JOSH NOREM

MICROSOFT OUTLOOK EXPRESS

Ease of migration: *Outlook Express* users often have to import and export their mail when performing a clean installation of Windows and the app makes the chore anything but easy. The included "Export Mail" function only outputs data formats compatible with *Outlook* and *Exchange*. And while you can manually copy and paste the mail folders yourself (for import into another installation of OE, for example) these folders are difficult to find. *Thunderbird*, on the other hand, imports OE mail quickly and easily. Unfortunately, it too lacks an export mail function, forcing you to follow the same silly process of copying and pasting files to accomplish the task. Both clients could use improvement in this category, but at least *Thunderbird* handles the OE migration process with ease.
Winner: *Thunderbird*



Usability: Day-to-day use of both of these clients is remarkably similar. Sending, receiving, and opening e-mail are very straightforward processes. *Thunderbird* does make sending images a bit easier in that you can quickly drag and drop the images in order to embed them in the message or the message header. *Outlook Express* requires menu navigation to embed an image in an e-mail. However, *Outlook Express* excels in other areas. It constantly displays the address book in the main window for easy access, while *Thunderbird* forces you to click into its address book. And *Outlook Express'* toolbars are highly customizable, while *Thunderbird* only lets you add icon separators wherever you choose. All told, it's a pretty close category, but OE gets the nod—just barely. **Winner: *Outlook Express***

Features: By its very nature, the streamlined *Outlook Express* is rather limited. But one cool feature it has over *Thunderbird* is the ability to add your *Hotmail* account to the accounts section without a third-party plug-in or utility. Considering the range of cool features that are included with *Thunderbird*, this is an easy win for the open-source crowd.
Winner: *Thunderbird*

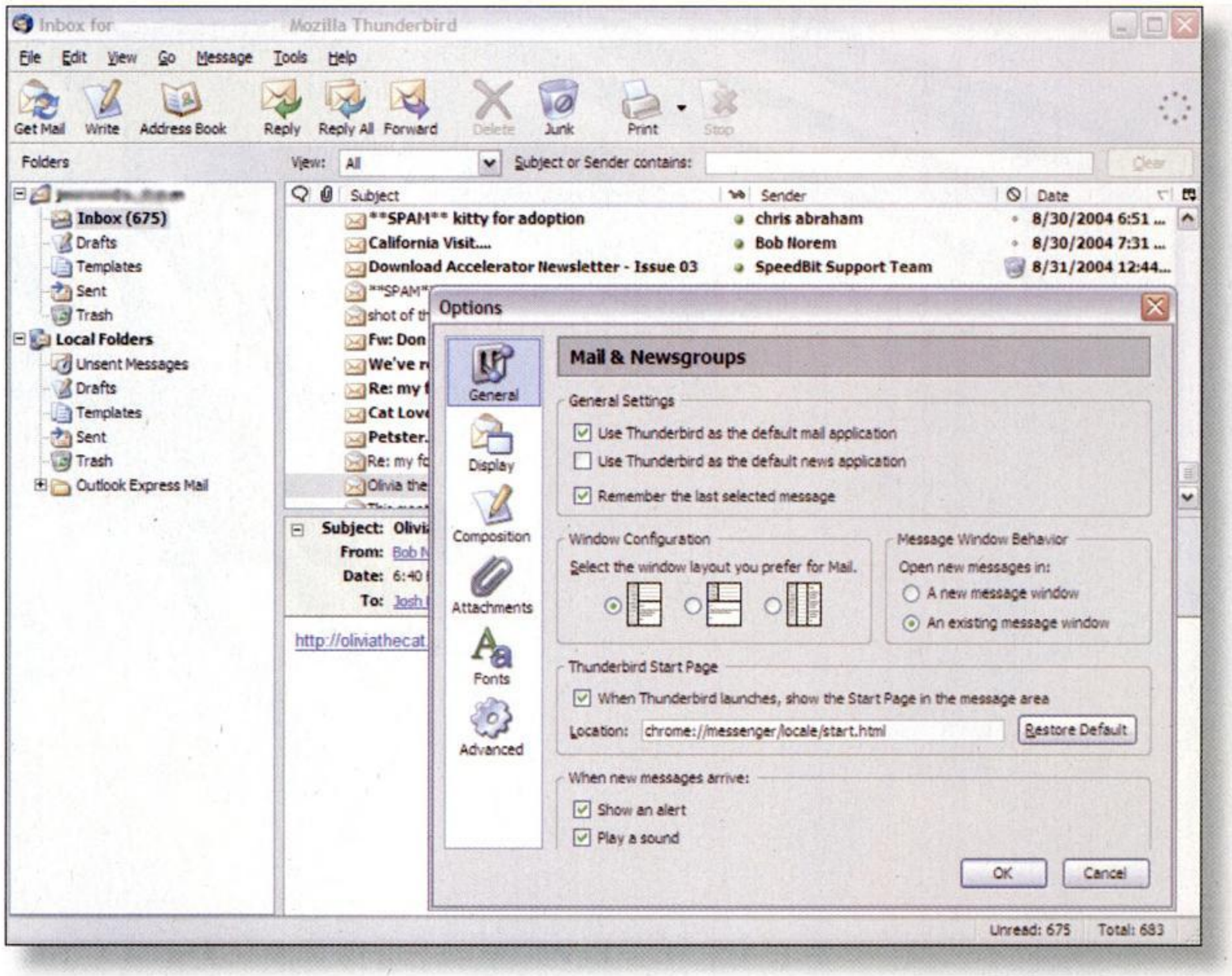
Expandability: This category is an open-and-shut case for *Thunderbird*. It's extension interface means anyone can develop add-ons to expand the app's capabilities, and many do. Extensions range from a calendar add-on to an RSS reader and continue from there, making it far more expandable than *Outlook Express*.
Winner: *Thunderbird*

Security and privacy: *Outlook Express* lets you disable remote images in e-mails so spam-senders won't know your computer's identity, but its support of ActiveX scripting can be a major vulnerability (it's turned off by default, but can be enabled via the bewildering "Internet zones" menu). Such scripts can allow your PC to be hijacked in order to spread viruses. Since Mozilla doesn't support ActiveX controls, there's never any worry about mistakenly opening a malicious e-mail. **Winner: *Thunderbird***

Copyrighted material

MOZILLA THUNDERBIRD

Ease of migration: Migrating from another e-mail client to *Thunderbird* is an easy process that's made even easier by the fact that you can import mail from Microsoft programs as well as *Eudora*. *Outlook Express* primarily allows importing from other Microsoft programs, but doesn't let you export mail messages in non-Microsoft data formats. The ease with which *Thunderbird* imports mail from an existing client makes it the clear winner.
Winner: *Thunderbird*



Features: *Thunderbird* isn't exactly feature-packed, but it has enough nice touches to make it more useful than *Outlook Express.* Coolest by far is the built-in beysian filtering spam detector, which works with an astonishing level of accuracy. By default it flags e-mails that it thinks are spam and after a few days begins automatically moving them into a Junk folder. You can mark any e-mail as "junk" with one click, and once you do, all messages that match the offender are automatically banished. You can also mark messages with a wide array of tags such as "personal" or "important," whereas *Outlook Express* only has "normal," "low," and "high" priority levels.
Winner: *Thunderbird*

Expandability: Because *Thunderbird* has a well-documented extension standard, developers worldwide have created add-ons for the app, which are free for anyone to download and use. With an array of extensions including everything from an address-book sidebar, to a dictionary look-up, to mouse gestures, users are able to customize their experience and dramatically boost *Thunderbird's* functionality, giving it an easy victory over *OE*. **Winner: *Thunderbird***

Security and privacy: Thunderbird blocks remote images, like *OE*, in order to keep your identity safe from spammers. But *Thunderbird* is a notch safer than *OE* because it doesn't use Microsoft's proprietary ActiveX controls. Even though these controls are turned off by default in *Outlook Express*, the fact that they could be turned on is a very bad thing.
Winner: *Thunderbird*

Usability: The applications have a similar look and feel but *Outlook Express* pulls out a win thanks to its customizable toolbars and the permanent presence of the address book in the main interface—two things *Thunderbird* lacks. This is surprising, given Mozilla's overarching emphasis on accommodating users.
Winner: *Outlook Express*

THE UPSHOT

Call us open-source lovin' hippies, but we think *Thunderbird's* flexibility and power make it superior to *Outlook Express,* much like its web-browsing brother *Firefox* has outpaced *Internet Explorer.* What's more, *Thunderbird* promises to continually improve. *Outlook Express* has remained literally unchanged for several years now.

You'd survive alright if you refused to switch—*Outlook Express* is a decent e-mail client that will serve your needs well. But we're here to tell you: *Thunderbird* is a worthy, more powerful, and safer alternative. ■

Copyrighted material

Impressive?

Imagine what we do for gaming.

Alienware high-performance systems are powered by Hitachi hard drives.

Area-51® systems
starting at $1,399

Copyrighted material

ALIENWARE®

THE ORIGINAL ULTIMATE GAMING MACHINE

Download the exclusive Alienware wallpaper at

www.alienware.com/ducks

1.800.alienware

(1.800.254.3692)

Price subject to change without notice. Price shown does not include keyboard, mouse, and monitor. Taxes and shipping charges not shown. Alienware can not be held responsible for errors in photography or typography. Actual case may vary in design. Alienware, Alienware alien head logo, and Area-51 are trademarks or registered trademarks of Alienware Corporation.

Copyrighted material

WatchDog

Say hello to Cody, WatchDog of the Month.

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after... >xVx >321 Studios >IBM >Belkin

Will the Real Review Please Stand Up?

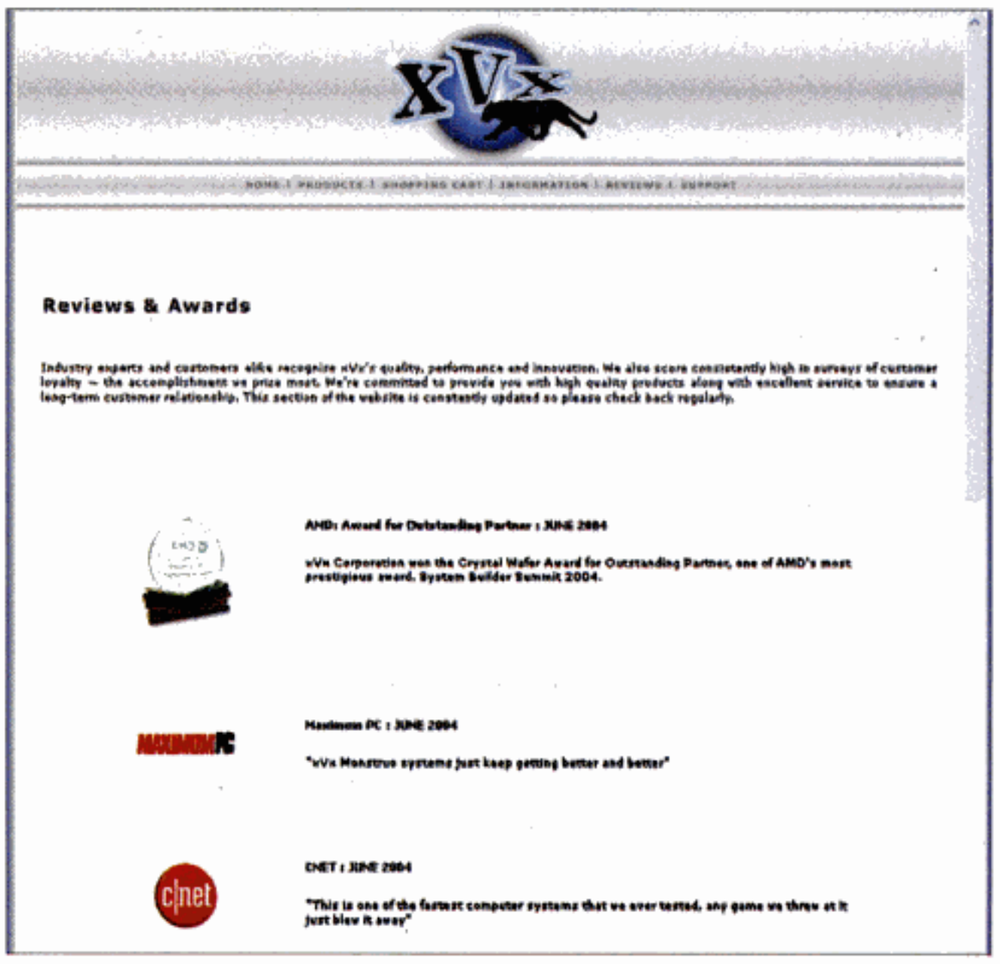
A potential PC consumer would understandably be impressed by xVx Corporation's web site (www.xvxonline.com). Its "Reviews & Awards" section is continually updated with positive excerpts attributed to respectable industry sources. For instance, in April, TechTV was quoted as saying: "If the Monstruo computer system that was sent to us is an indication of PC maker xVx's future success, the company's going to do quite well." A subsequent installment reported CNET as saying: "This is one of the fastest computer systems that we ever tested." *PC Gamer* supposedly had this to say: "xVx is going in the right direction to become the next Rolls-Royce in the computer market." But what really caught the Dog's eye was the glowing praise from none other than *Maximum PC:* "xVx Monstruo systems just keep getting better and better."

That's pretty good copy—if it were true. Fact is, *Maximum PC* has never reviewed an xVx computer, and neither has its sister publication *PC Gamer,* which certainly raises suspicions about xVx's many other supposed accolades.

The Dog questioned xVx Corporation president Edgar Joel Intriago about the erroneous quotes. Intriago said he had no intention of putting those reviews on the web site. "The webmaster of the company put the wrong [company] logos into the review page of xVxonline.com. I didn't want to put a review page on the web site as we still don't have many of them." Intriago said the reviews had since been removed from the site and he apologized for any inconvenience or confusion the reviews may have caused.

At press time, five of seven company reviews that were on the web site, including those mentioned above as well as an AMD Crystal Wafer Award, were removed from the xVx Corporation web site. Only two review excerpts remain: quotes attributed to Reuters wire service and the *Boston Globe*, which Intriago insists are authentic.

The Dog was unable to verify the authenticity of the Reuters review, but glaring grammatical errors in the two-sentence quote make us leery. As for the *Boston Globe*, we requested a search of its news library database for a review containing the sentence: "If anyone ever said that there was no such thing as a luxury computer, ooh they were wrong, xVx Corporation are creating them as we speak." The search came up empty, which was no surprise to the Dog.



Five out of seven reviews were pulled from xVxonline's web site after at least two of them didn't turn out to match reality.

3-2-1... Zero!

DEAR DOG: I purchased *DVDXCopy Platinum* last Christmas and quickly sent in the information for the $50 rebate. I have been waiting for six months. Though 321 Studios says the rebate has been approved, the story is always the same whenever I call: I will get my rebate in two to three weeks, but it never comes. Could you look into this? Was this all just a big lie? Is this a disreputable company producing questionable products, and then boosting sales with empty promises so they can take the money and run? (Please don't accept the answer that "the check is in the mail" because I've heard that one about eight times already.)

—BRUCE WILLIGHAM

> *"THAT'S PRETTY GOOD COPY — IF IT WERE TRUE. FACT IS, MAXIMUM PC HAS NEVER REVIEWED AN XVX COMPUTER AND NEITHER HAS PC GAMER."*

THE DOG RESPONDS: Unfortunately, it's bad news for Bruce and any other customers of 321 Studios who are awaiting refunds, rebates, or further support. The company shut its doors after losing a long legal battle with the movie industry. When 321 Studios first began selling its controversial DVD copying program, which let users easily duplicate commercial DVDs, it anticipated a legal tussle. 321 Studios sued movie companies hoping to force the issue, and in the end, lost.

In a message on the company's web site, officials stated: "Despite 321 Studios' best efforts to remain in business, injunctions entered against 321 Studios by three US Federal courts earlier this year have resulted in 321 Studios no longer being able to continue operating the business."

The company says it will keep its knowledge base online until August 2005 but cannot offer any other technical support. Those trying to obtain rebates are advised to visit: http://rebates.321studios.com. The Dog was unable to reach company officials but the chances of getting a rebate check are probably slim.

So how can other companies continue to offer software that lets consumers duplicate DVDs? It's simple, they don't actually bundle the software that lets consumers defeat a DVD's encryption. Instead they strongly hint to consumers that they locate programs such as Slysoft's *AnyDVD,* which disables DVD encryption.

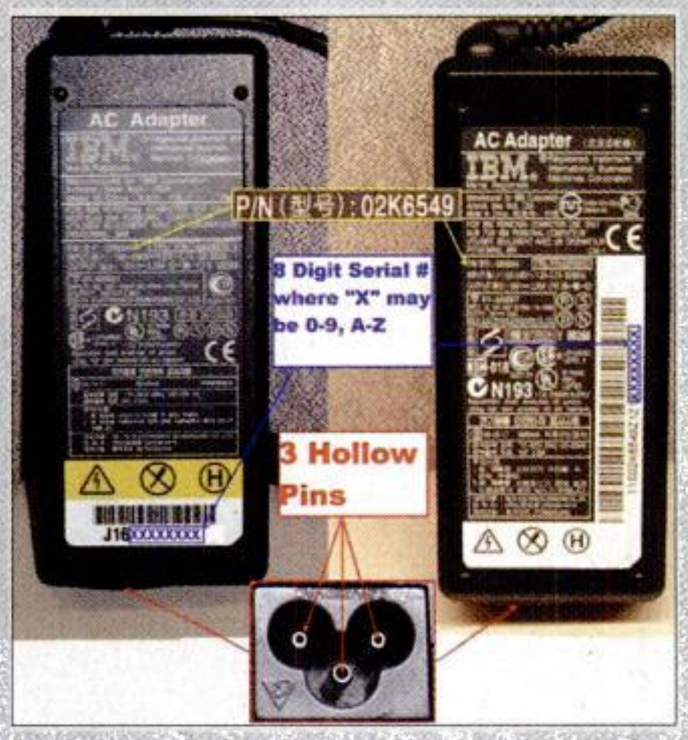
Owners and prospective buyers of 321 Studios' products may be wondering if they can still use a program if it's been deemed illegal by the courts. The answer is yes, according to 321 Studios. The injunction is against the company

Copyrighted material

only. Still, there are other issues surrounding 321 Studios' products. The company's products have always needed to be activated by phone or the Internet when first installed. As things stand, phone support is no longer offered, and Internet activation is certain to vaporize along with the company's Internet presence in 2005. When you factor in the lack of support for upcoming drives as well as newer disc formats like dual-layer, it seems wise for consumers to stay away from the products even if they're in the clearance bin. Woof. ■

RECALL ALERT

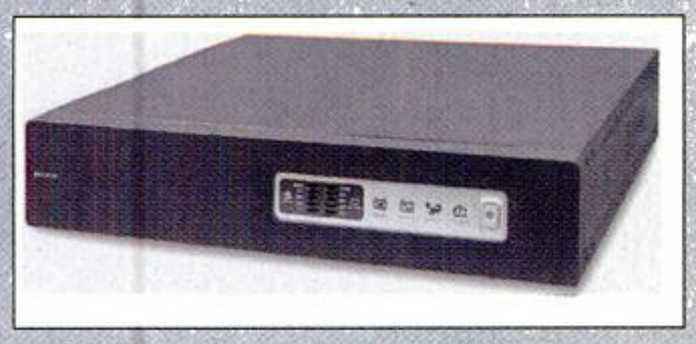
IBM is voluntarily recalling some 553,000 AC power adapters sold with Thinkpad notebooks between January 1999 and August 2000. The adapters can overheat, cause damage to the circuit board, and melt the plastic housing. Six people have reported problems with the adapters, some claiming minor property damage. The 56 watt adapters were mostly shipped with Thinkpad I Series, 390, 240, and S series notebooks. The bad adapters use hollow pins where the AC plug connects to the unit and are labeled with the part number 02K6549. Power supplies with solid pins or a part number other than 02K6549 are not affected. If you have a defective power supply, IBM says it should not be used or left plugged in without a person nearby. The company said it will replace the power supply free of charge. To request a replacement, call IBM at 800.410.5629 or visit www.adapterprogram.com. Last year at this time, IBM also expanded its recall of bad monitors from 56,000 to 119,000 G51 CRT monitors sold in the United States. For more information on that recall visit www.pc.ibm.com/g51recall.



IBM's ThinkPad power adapters: way too hot.

Apple is recalling about 28,000 batteries for its 15-inch G4 PowerBook computers. An internal short can occur and cause the battery to overheat and potentially start a fire. Apple has received four reports of the batteries overheating but no injuries. The batteries were sold between January 2004 and August 2004 in notebooks costing between $2,000 and $2,600, and individually for $130. The batteries contain cells made during the last week of December 2003 and have the model number A1045 and a serial numbers that begins with HQ404, HQ405, HQ406, HQ407, or HQ408. Apple is asking consumers to immediately stop using the batteries and to contact 800.275.2273 or visit www.apple.com/support/powerbook/batteryexchange.

Apple G4 batteries can short, causing fires.



Belkin's rack-mounted UPS is incorrectly wired.

Belkin is recalling 1,200 rack-mount uninterruptible power supplies that pose a shock hazard. The units were wired incorrectly, creating a reverse polarity. Affected units are the OmniGuard 1100 model F6C110-RKM-2U, OmniGuard 1500 model F6C150-RKM-2U, OmniGuard 2300 model F6C230-RKM-2U, and OmniGuard 3200 model F6C320-TKM-3U. The units were sold between Sept. 2003 and June 2004 for $560 to $1,360. Belkin advises consumers to immediately stop using the units and contact Belkin for a free replacement at 800.223.5546 ext. 2064 or visit www.belkin.com.

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

"You take audio and video and jam 'em together 'til they rock."

—Stephanie Heer
B.A. in Multimedia
Class of 2004

University of Advancing Technology
UAT
Learn. Experience. Innovate.

www.uat.edu *or* **800.658.5744**

Available online or on-campus.

GAME DESIGN
DIGITAL ANIMATION
E-COMMERCE
MULTIMEDIA
WEB DESIGN
VIDEO PRODUCTION
NETWORK SECURITY
SOFTWARE ENGINEERING
TECHNOLOGY MANAGEMENT
DATABASE MANAGEMENT

Begin Your Journey

Enter the amazing world of Vana'diel®.
Join an ever-growing population
of adventurers in exploring the only
online FINAL FANTASY game, the
award-winning FINAL FANTASY XI!

Available
for Windows®

Or specially packaged
with the Hard Disc Drive
for your PlayStation®2
computer entertainment system

Expand the Adventure

The world of Vana'diel gets even
bigger with this FINAL FANTASY XI
expansion pack, featuring massive
new regions to explore, frightening
new enemies to engage, and an
unfolding mystery to confront.

PlayStation.2

ONLINE
BROADBAND AND DIAL-UP

TEEN
T
CONTENT RATED BY ESRB
Animated Blood
Mild Language
Violence
Game Experience May Change During Online Play

PC CD-ROM SOFTWARE
for Windows®

The way it's meant to be played
NVIDIA

A WORLD BEYOND BORDERS

FINAL FANTASY® XI

ONLINE

Chains of Promathia™

THIS EXPANSION PACK CANNOT BE PLAYED WITHOUT INSTALLING THE ORIGINAL VERSION OF FINAL FANTASY XI. Users are responsible for all applicable Internet and subscription fees. Online play requires Internet connection, Internal Hard Disc Drive (for PlayStation 2) and Network Adaptor (for PlayStation 2) (sold separately).

© 2001-2004 SQUARE ENIX CO., LTD. All Rights Reserved. IMAGE ILLUSTRATION: © 2004 Yoshitaka Amano. FINAL FANTASY and VANADIEL are registered trademarks of Square Enix Co., Ltd. SQUARE ENIX, the SQUARE ENIX logo, PLAYONLINE, the PlayOnline logo, and THE CHAINS OF PROMATHIA are trademarks of Square Enix Co., Ltd. Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries. NVIDIA, the NVIDIA Logo and the Way It's Meant to be Played Logo are trademarks and/or registered trademarks of NVIDIA Corporation in the United States and other countries. "PlayStation" and the "PS Family" logo are registered trademarks of Sony Computer Entertainment Inc. The Online icon is a trademark of Sony Computer Entertainment America Inc. The ratings icon is a trademark of the Entertainment Software Association. Software platform logo ™ and © IEMA 2004.

PlayOnline™

SQUARE ENIX™
www.playonline.com

Copyrighted material

Build Your PC

Copyrighted material

The Right Way

Got a Phillips head screwdriver? Good. It's all you need to build a custom rig. Well, that, a few hours, and our expert 21-point guide to building a computer—the right way. The *Maximum PC* way

BY WILL SMITH

We're going to say this one more time, for good measure. If you own a Phillips head screwdriver, you can build your own PC. And, frankly, you'd be a fool not to. Custom-building a computer is one of the great spirit quests of our time—it separates the men from the boys, the hardcore from mainstream, the *Maximum PC* readers from the readers of... um, lesser PC magazines. You call yourself a power user? We say, *prove it, buddy.* Step up to the plate and BYO—Build. Your. Own.

The reality is that building your own PC is actually simpler than assembling a bicycle or a piece of Ikea furniture. But that's not to say the process is free of potential pitfalls. If you want to build a machine using the latest cutting-edge hardware, there's a lot you need to know before you begin. Improperly inserting an LGA775 processor can destroy your CPU, your motherboard, or both! To avoid such a tragedy, we're going to show you how to build your PC the right way. The only way. The *Maximum PC* way.

Inside this epic tale of PC building gone good, you will find:

✔**A LAUNDRY LIST** detailing each and every component you need—for PCs of three different price-ranges. Each configuration is *Maximum PC*-certified, meaning our Lab experts hand-built it and guarantee it will work.

✔**A SHORT CHECK LIST** detailing each and every step you need in order to build your system. Clip it and save it for later!

✔**A CUT-OUT QUICK REFERENCE** that allows you to record your PC's most vital information.

✔**A COMPREHENSIVE 9-PAGE WALK-THROUGH** where we show you every single step necessary to assemble your PC, get Windows running, and troubleshoot any problems you encounter along the way.

Oh, one more thing before we begin: static electricity. In short, it can kill sensitive computer components like CPUs and videocards, so it's important you ground yourself, which prevents static buildup from occurring between you and your case. Simply touch a metal portion of the case before you pick up any of your components and you'll be just fine.

Now clear off a nice big workspace (the den will do nicely) and let's get started!

WARNING!

Think you're an expert? Think again. Some of the new hardware we're going to discuss can be delicate and requires special care to install. Read our guide *now* or risk destroying your expensive hardware!

Copyrighted material

Build It Checklist: The Short, Short Version

Use this step-by-step list anytime you build a PC

☐ **1** **Prep your case.** Get your case ready before you get started.

☐ **2** **Add power.** If your case didn't come with a power supply, install the PSU now.

Caution!

☐ **3** **Prep your mobo.** Screw the motherboard mounts into your case.

☐ **4** **Install the backplate.** It's important to install the proper ATX backplate for your mobo into your case.

☐ **5** **Mount the mobo.** Hey, it's easier said than done.

Caution!

☐ **6** **Socket your processor.** Install your CPU. Take your time—a faulty install can fry your processor!

☐ **7** **Add the memory.** Install your RAM modules.

☐ **8** **Arm the switches.** Connect the case switches and lights to your motherboard.

Caution!

☐ **9** **Power external peripherals.** If your case and mobo have them, now is the time to connect your internal USB and FireWire headers to the case-mounted ports.

☐ **10** **Install the videocard.** The title says it all. Plug your videocard into its PCI Express or AGP slot.

☐ **11** **Take your rig for a test ride.** Take a minute to plug your machine in and give it a test boot. It's much easier to troubleshoot now before you install the rest of your hardware.

☐ **12** **Prep the hard drives.** Before you can install your hard drives, you need to configure them and affix whatever mounting devices your case demands.

☐ **13** **Mount the hard drives.** Screw, slide, or hook. Now is the time to put the hard drives in your case enclosure.

Caution!

☐ **14** **Connect your hard drives.** Whether you're using Serial ATA or parallel IDE drives, you need to connect them to your motherboard and power supply.

☐ **15** **Prep optical drives.** Get drives ready for mounting, set any jumpers, and attach drive rails.

☐ **16** **Mount the optical drives.** Slip 'em into your case, then permanently attach them.

☐ **17** **Connect the optical drives.** Just like you hard drives, your CD and DVD drives are just bay decorations unless you connect them to your mobo and power supply.

☐ **18** **Install the rest of your cards.** Your soundcard, TV tuner, and any other internal peripherals need to be installed now.

☐ **19** **Last-minute housekeeping.** Connect any remaining peripherals to the power supply. Don't forget the fans for your case and videocard!

Caution!

☐ **20** **Configure your BIOS.** Set your CPU speed and designate a boot drive.

Caution!

☐ **21** **Install Windows XP.** Install the OS, your drivers, Service Packs, and security updates.

Quick Reference: Crucial Information

There are some names and numbers you absolutely must have when you configure a new machine, and it helps to have them handy. Here's our list—clip this out and tape it to the inside of your case.

MOTHERBOARD MODEL:

CPU SPEED:

VIDEOCARD MODEL:

WINDOWS XP SERIAL KEY:

DIAL-UP INFORMATION (OR PPPOE LOGIN)

DIAL-UP NUMBER:

USERNAME/PASSWORD HINT:

TECH SUPPORT PHONE NUMBER:

NETWORK INFO:

WIRELESS NETWORK NAME:

WIRELESS NETWORK WEP KEY:

STATIC IP ADDRESS:

DNS ADDRESS:

SUBNET MASK:

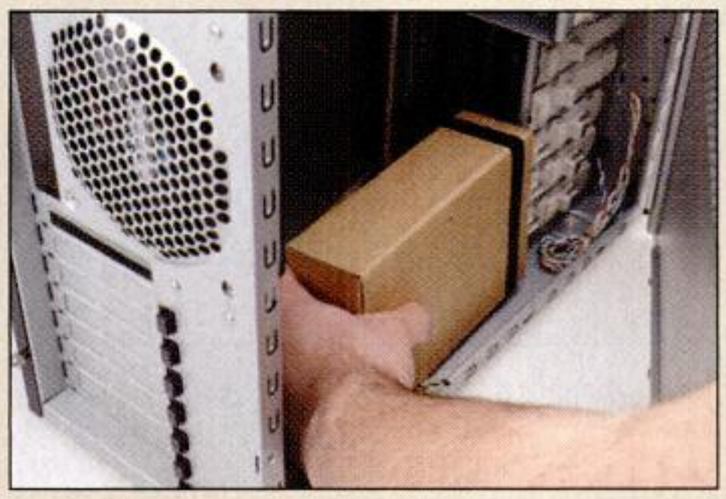
GATEWAY:

Copyrighted material

Build Your PC!

You've got your parts, you've got your screwdriver. Now it's time to grab a tasty beverage, situate yourself in a static-free area, and get started!

Step 1: Prep your case



Most PC cases come with a fair amount of hardware. Everything from specialized standoff mounts that will keep your mobo at just the right height, to front-mounted USB ports, to the proper screws for mounting fans, should be in a box inside your case. Before we can get started, you'll need to remove your case door, and pull out that box of hardware. Got it? Great!

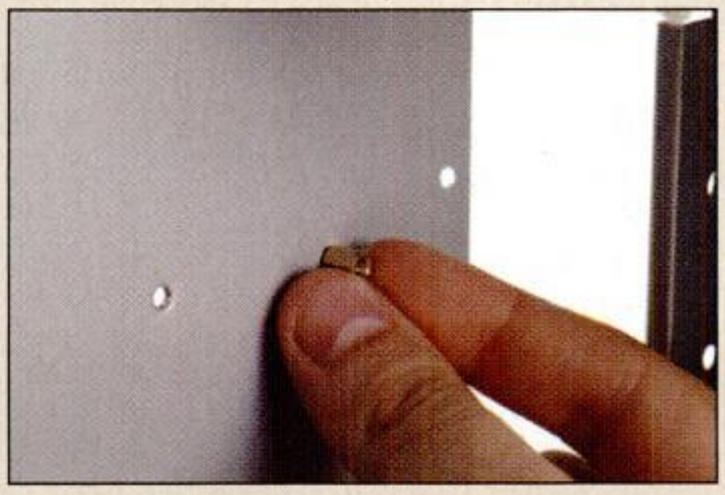
Since you're going to lay the case down on its side to work, it's a good idea to take both side panels off. Taking the case doors off prevents you from scratching them while you install the rest of your gear.

Step 2: Add power

If your case doesn't come with a power supply, you need to install the one you bought. Usually, there's some sort of mounting bracket screwed into the back of the case. You need to unscrew the bracket before you can mount the power supply to it. Make sure you pay attention to the way the bracket was on the case before you removed it. The entire assembly only goes on one way. If you flip the bracket over, it just won't mount properly.

Once the PSU is attached to the bracket, slide the power supply into your case and screw the bracket down.

Step 3: Prep your mobo



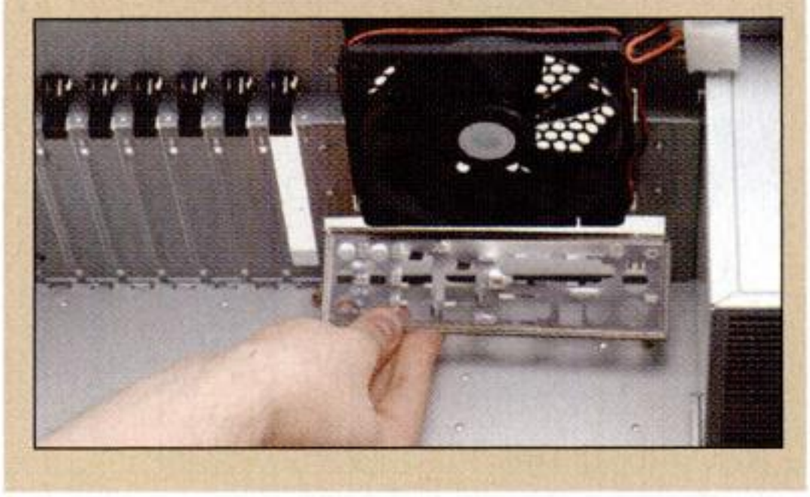
In order to mount your motherboard in the case, you need to first install motherboard standoffs. (If your case has a motherboard tray, you'll have a much easier time if you remove the tray from your case.) Each motherboard has a slightly different standoff config, so hold the mobo up to the tray and note which holes on your mobo line up with the holes on the tray.

It's vital that you not put extra standoffs in the case that don't align with holes on the mobo. The extra standoffs can short contacts on the back of the mobo, and render your whole system unbootable—or cause permanent damage to your hardware.

Caution! ***"It's vital that you not put extra standoffs in the case that won't align with holes on the mobo."***

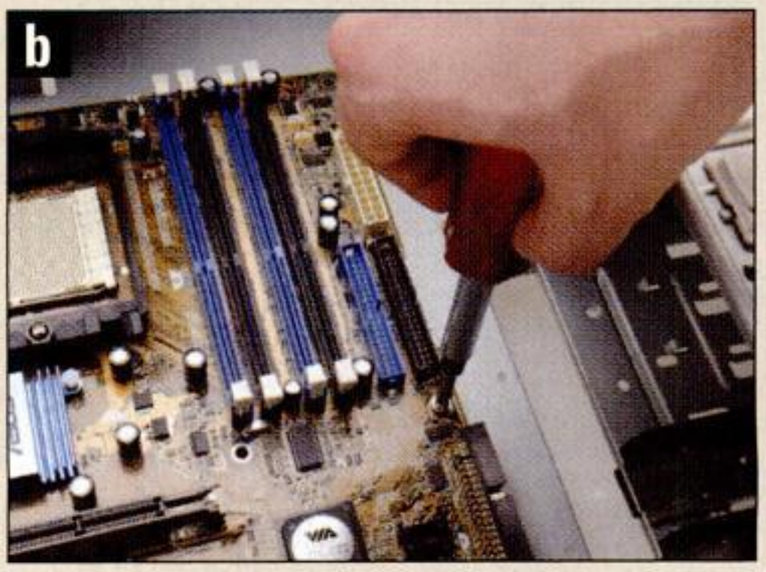
Step 4: Install the backplate

Because there are dozens of possible configurations for the ATX backplate—the thing on your mobo with holes for the PS/2, USB, serial, parallel, network, and even FireWire connectors—each motherboard comes with a custom plate, which pops into a standard-size hole in your case. It mounts from the inside, so you'll need to line it up with the hole and pop it into place. Make sure that it faces the right way. Usually the PS/2 ports go nearest the power supply.



Step 5: Mount the mobo

To mount the mobo, line up its rear connectors—the PS/2, USB, and other ports—with the holes in your ATX backplate, and slide the mobo into the case at a 45 degree angle **(a)**. Once the port connectors have lined up with the backplate, lower the front edge of the mobo. Once that's done, screw down the mobo **(b)**. Be careful not to strip the screws. A good practice is to reverse each screw one quarter of a turn before you begin screwing it down.

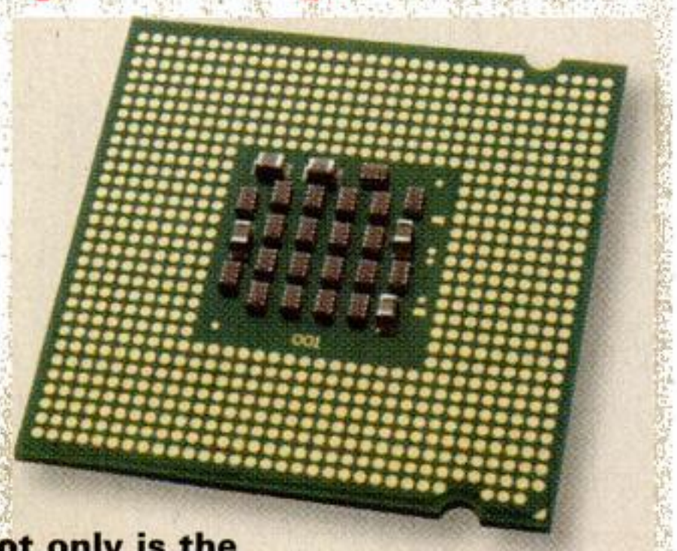


Copyrighted material

Maximum PC Approved: 3 Computers for *Any* Budget

The first step in building your own PC is choosing the right components. To help you, we spec'd three different machines—suitable for three different budgets—to help you eliminate any guesswork. Each of these three PC configurations is *Maximum PC* tested. That means we guarantee the components will work together upon assembly! Feel free to mix and match hardware to suit your needs. After all, if you're not a gamer, there's no reason to pay good money for an expensive gaming videocard.

High-end System



Not only is the 3.6GHz P4 Prescott fast, it has incredible overclocking potential!

MOTHERBOARD: Asus P5AD2 Premium $260

CPU: Intel Pentium 4 w/ HT – 3.6GHz $640

MEMORY: Crucial DDR2/533 1GB DIMM $320

VIDEOCARD: Radeon X800 XT Platinum 256MB PCI Express $500

1ST HARD DRIVE: Western Digital Raptor WD740GD $180

2ND HARD DRIVE: Maxtor DiamondMax Plus10 300GB $250

OPTICAL DRIVE: Sony DRU-700A Dual-Layer DVD±RW Writer $130

SOUNDCARD: Creative Labs Audigy 2 ZS Gamer $115

CASE: Silverstone Nimiz $250

PSU: PC Power and Cooling Turbo Cool 510 Deluxe Express $220

MOUSE: Logitech MX1000 $100

KEYBOARD: Logitech Elite Keyboard $25

MONITOR: NEC MultiSync FE211SB $600

SPEAKERS: Logitech Z-5500 Digital $400

OPERATING SYSTEM: Windows XP Professional OEM $90

TOTAL = $4,080

Midrange System

MOTHERBOARD: Asus A8V Deluxe $130

CPU: AMD Athlon 64 3800+ $640

MEMORY: Kingston 1GB PC3200 DDR DIMM $150

VIDEOCARD: EVGA GeForce 6800 Ultra $500

HARD DRIVE: Seagate 7200.S7 100GB Serial ATA $120

OPTICAL DRIVE: Plextor PX-712A DVD±RW Writer $130

SOUNDCARD: Creative Labs Sound Blaster Audigy 2 ZS Gamer $115

CASE: Cooler Master Centurion 5 $100

MOUSE: IntelliMouse Explorer 4.0 $20

KEYBOARD: Logitech Elite Keyboard $25

MONITOR: Samsung SyncMaster 172X LCD $550

SPEAKERS: Klipsch GMX A-2.1 $120

OPERATING SYSTEM: Windows XP Professional OEM $90

TOTAL = $2,690

The Plextor PX-712A doesn't include dual-layer DVD-burning support, but it is one of the fastest single layer DVD burners you can buy.

Low-end System

You can afford a kick ass CRT monitor with even the cheapest rig. The NEC Multisync FE911SB looks great and is a bargain at $250.

MOTHERBOARD: Asus A8V Deluxe $135

CPU: AMD Athlon 64 3400+ $290

MEMORY: Kingston 512MB PC3200 DDR DIMM $75

VIDEOCARD: Radeon 9600 XT $100

HARD DRIVE: Western Digital Caviar WD2000JD 200GB $120

OPTICAL DRIVE: Plextor PX-708A DVD±RW Writer $120

SOUNDCARD: Creative Labs Audigy 2 ZS $85

CASE: Antec Super Lanboy w/350 PSU $140

MOUSE: IntelliMouse Explorer 4.0 $20

KEYBOARD: Logitech Elite Keyboard $25

MONITOR: NEC MultiSync FE991SB $250

SPEAKERS: Logitech Z-2200 $120

OPERATING SYSTEM: Windows XP Professional OEM $90

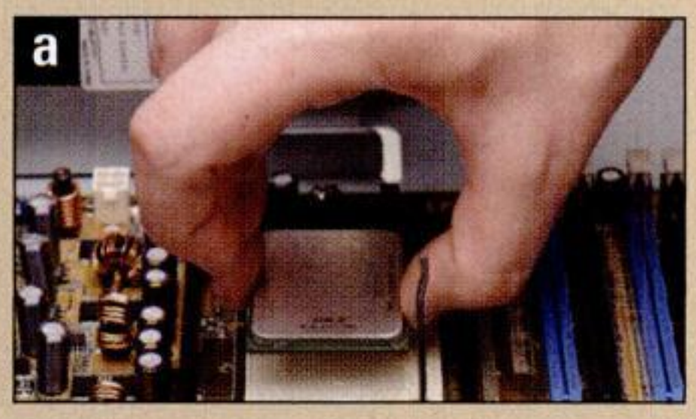
TOTAL = $1,570

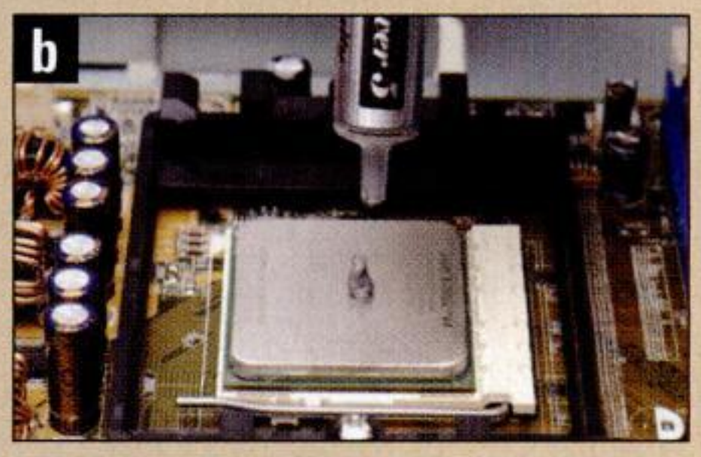
Copyrighted material

Step 6: Socket your processor

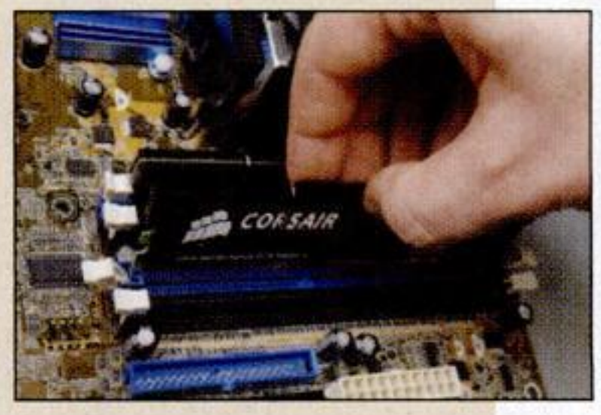
This is the most delicate part of your installation, so take your time. Make sure you're grounded before you handle the CPU (simply touch a metal portion of the case before you pick it up), and we can get started. For old-style Athlon and Pentium 4 processors, the procedure is the same. If you have a new Intel LGA775 processor, check the sidebar at the bottom of the page. First, you need to lift the little lever beside the socket. Next, line the processor up with the socket; one corner will be keyed, so that the proc can only go into the socket one way. Gently lower the chip into the socket **(a)**. *Make certain you do NOT apply any force to the processor. This can damage it permanently*! It should drop into place. Once it does, you can lower the lever back down until it clicks.

Now you need to add thermal paste to the CPU **(b)**. (If you're using a stock Intel or AMD heatsink, use the thermal pad that's provided.) Apply a thin layer of paste to your CPU's heat spreader. Smooth it down with a business card or other suitable trowel. Then affix the heatsink to the socket. Usually, this is as simple as setting the heatsink in the socket, lining up a couple of clips, and snapping them into place.



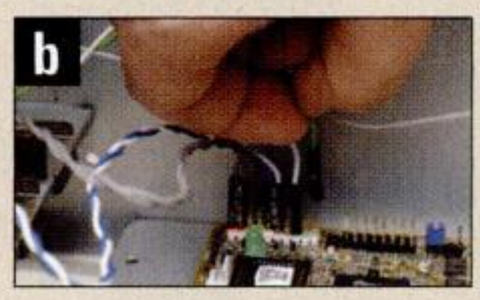


Step 7: Don't forget memory



Installing RAM is very easy, but it requires more force than most people expect. To install memory, first consult your motherboard's documentation to determine which slots you need to put memory in to enable dual-channel mode. Usually they're color coded, but this can vary among manufacturers. Once you know which slots to use, examine the RAM and the memory slot. Note that the sticks only go in one way. Line up the notch in the RAM stick with the key in the slot and then push down on the stick, applying even force to both ends of the stick until it clicks into place. Repeat with the second stick.

Step 8: Arm the switches

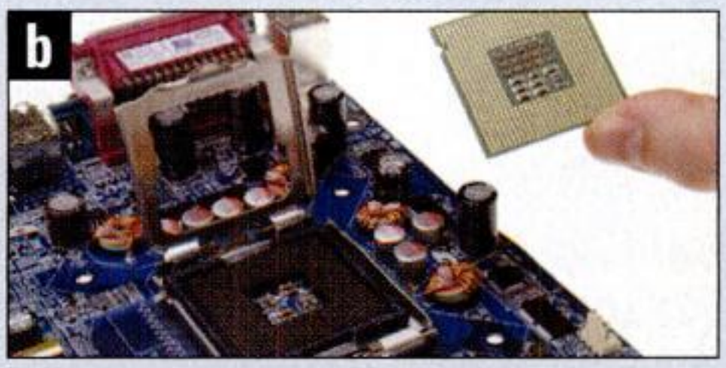


Now you need to connect your case's buttons and lights to your motherboard. You'll need to consult your mobo's manual again, as each motherboard is different. Connecting the headers, which run from the case to the mobo, is as simple as lining up the pins **(a)** and applying a tiny amount of force, until the wire slides into place **(b)**.

All you really need to get your system up and running is the power switch connector, but don't be a half-ass. Once you've connected the reset and power switches, it's time for the lights. It doesn't matter which wire goes to which lead for the switches, but the lights require proper polarity. Your mobo manual will tell you which of the pins is positive; usually the wire that's colored is the positive lead. If you get it backwards, don't worry.

How to Install Your LGA775 Processor—the Right Way

Much like your friendly *Maximum PC* editor, Intel's new LGA775 CPU interface is delicate and fragile. Read this before you install yours to avoid permanent damage.



Intel's new LGA775 CPU interface is supposed to herald a new era of performance by eliminating the need for pins in the CPU and reducing resistance. Unfortunately, because LGA775 moves the fragile pins to the motherboard, the socket's official lifespan is a meager 25 insertions. Because the new socket is so delicate, you need to finesse it.

Before you handle a processor, make sure you're grounded. Unlock the socket lever on your new motherboard and flip the load plate open. You should notice a plastic cover on the metal load plate. Remove this plate and keep it somewhere safe **(a)**. If you need to ship the board without the processor in it, this cover will provide protection. (Some motherboard vendors, in fact, will only honor RMA if you ship the board with this cover.)

Pick up the CPU with your thumb and index finger **(b)** and carefully align it with the notches in the socket. Insert the CPU straight down into the socket **(c)**. Be careful not to slide or drop any part of the processor when you seat it—this will bend the pins! Once the CPU is seated and the notches match, put the load plate down and lower the socket lever. You're good to go.

Copyrighted material

You stay in wonderland and I show

you how deep the rabbit hole goes.

THE MATRIX ONLINE. THE MOST REALISTIC URBAN ENVIRONMENT OF ANY MMO.

The Matrix goes massively multi-player. An intelligent mission system. Ongoing input from the Wachowski Brothers. Realistic and intense fighting in wire-fu and bullet-time. The chance to alter Matrix history forever. And a huge, ever-evolving world the likes of which have never been seen in MMOs. It's *The Matrix Online* and the rabbit hole just got deeper.

RATING PENDING
RP
CONTENT RATED BY ESRB
Visit www.esrb.org for updated rating information.

Sega is registered in the U.S. Patent and Trademark Office. SEGA and the Sega logo are either registered trademarks or trademarks of Sega Corporation. Developed by Monolith Productions, Inc. MONOLITH and the Monolith logo are trademarks of and © Monolith Productions, Inc.

TM and © Warner Bros. Entertainment. All Rights Reserved. THE MATRIX ONLINE, characters, names and all related are trademarks of and © Warner Bros. Entertainment Inc. 2004.

Copyrighted material. .

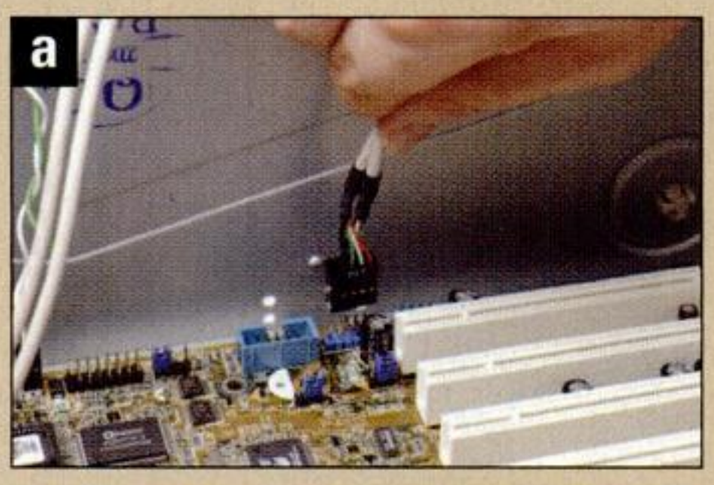
THE
MATRIX
ONLINE

To pre-order, jack into www.thematrixonline.com

Copyrighted material

Step 9: Power external peripherals

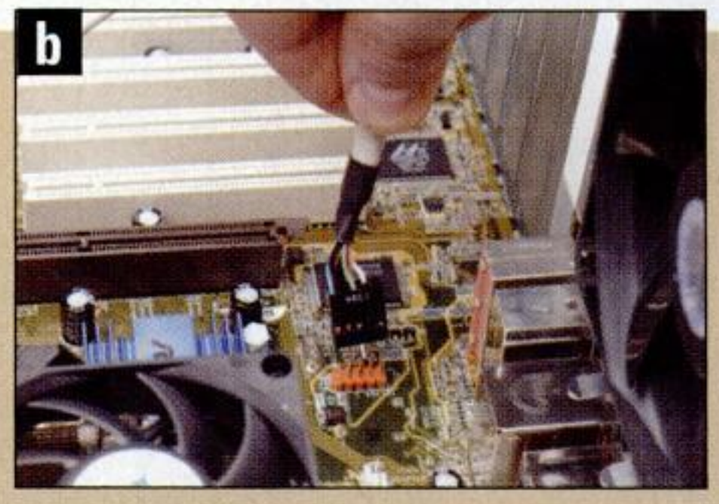
Connecting USB and FireWire ports is simple. Today, case enclosures include pre-configured connectors for each type of port. All you need to do is line up the connector with the header on the mobo, and gently push down.



Both FireWire and USB cables are keyed so they won't go in if they're not lined up properly.

Occasionally, you'll find a case where the USB cables aren't in a convenient connector block, instead each wire is separate. If that's the case, your mobo manual should include a pin-out diagram that will show you how to connect the wires.

Make absolutely certain you don't switch the USB **(a)** and FireWire **(b)** headers—it's not always easy to tell the cables apart. Consult your case manual if you're not positive which is which. If you make this mistake and then plug a device into the wrong port, you can destroy both the device and the motherboard you're connecting it to!



Many motherboards lack onboard headers for front-mounted FireWire, but there's an alternative. Most Sound Blaster Audigy 2 cards include internal FireWire headers. When you install the soundcard, just slip your FireWire cable onto the header at the top of the PCI card.

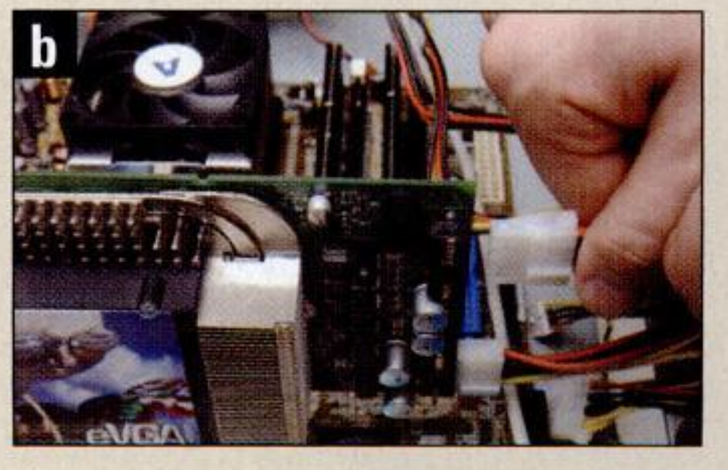
Caution! ***"If you plug a FireWire device into a USB bus, you can destroy both the device and the motherboard you're connecting it to!"***

Step 10: Install the videocard

Installing a videocard is super simple. First, you need to remove the slot cover that lines up with your AGP or PCI Express slot. If you're having trouble telling which slot is which, the videocard slot is usually the one closest to your CPU.

The trick to installing any kind of card in a slot is to apply gentle force evenly across the length of the board. You should not have to push hard at all to get an AGP or PCI Express board into its slot. Line up the card's backplate (the piece of metal with the output connectors on it) with the slot on your case, make sure the card is level with the slot **(a)**, and gently push the card down into the slot.

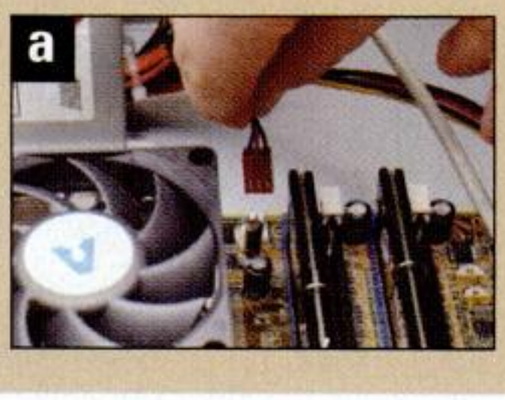
Once the card is securely in the slot, screw the backplate into the case, and connect external power from the power supply. If you're using a card that requires multiple power inputs—like the GeForce 6800 Ultra **(b)**—you need to use two separate power cables. Using one cable with two ends doesn't deliver enough juice to the card.

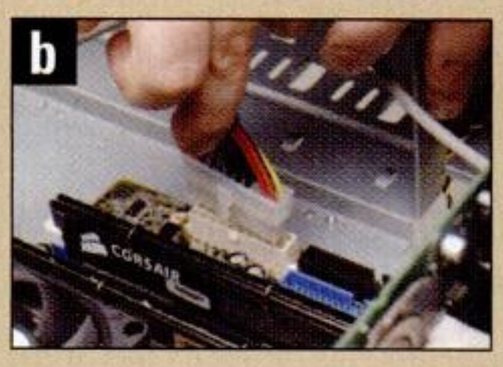


Step 11: Alpha test: Take your rig for a test ride

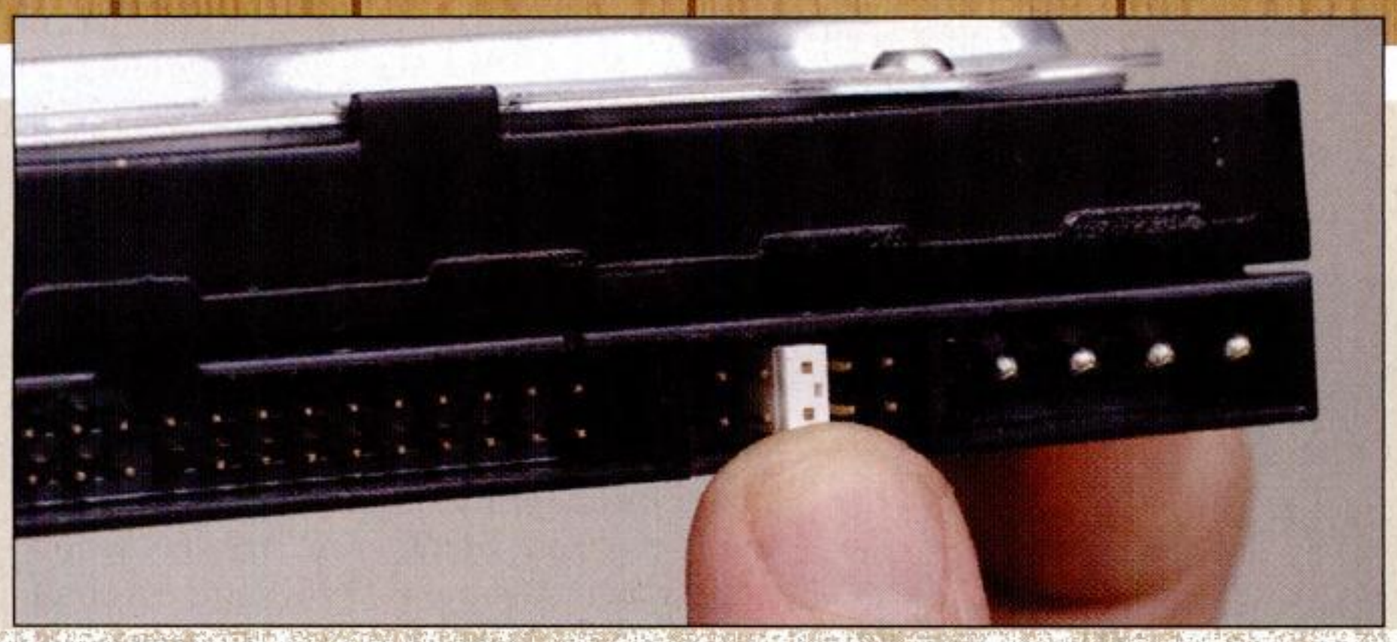
Before we install the rest of the hardware, let's take a moment to power up your rig and make sure everything is working properly. First, verify that the CPU fan is connected to either the three-pin mobo header labeled CPU or to a four-pin Molex connector from your power supply **(a)**. Then plug the ATX power connector—it's the big, wide one that comes out of your power supply—into the appropriate socket on your mobo **(b)**. It's keyed, so it only goes in one way. You should also connect the ATX 12V connector to your mobo **(c)**. It too is keyed, and only goes in one way.

Once your power connectors are plugged in, connect your keyboard, monitor, and power to the machine. Now fire it up. You should see the power-on self-test (POST) screen. If you don't, don't get nervous! Even *Maximum PC* editors occasionally build machines that won't boot on the first try. If yours doesn't, turn to page 47 for some basic troubleshooting tips that should get you back on track. If it does, pat yourself on the back and carry on to step 12.





Copyrighted material



Step 12: Prep your hard drives

Before you can mount your hard drives in your system, you need to prep the drives. First, consult your case manual and mount whatever kind of rails or other gizmos necessary to install your hard drives in your case. Once that's done, you need to configure your drives for your rig.

There are two basic interface technologies used for hard drives today: parallel ATA and Serial ATA. You're probably familiar with parallel ATA, which uses the wide, old-fashioned, 80-pin ribbon cables, but you may not have encountered Serial ATA drives yet. You can connect two devices to a single parallel ATA port, but connect only one to a Serial ATA port. We're going to explain how to configure both.

Parallel ATA

When you're connecting a parallel ATA drive to your system, whether it's a hard drive or optical drive, it's very important you configure the drive's master or slave settings. Parallel ATA drives connect to the IDE ports on your mobo. Each port is a single IDE channel. Remember, even though each IDE channel can support two drives (one drive configured as master and another configured as slave), your system will only be able to read or write to one drive at a time—this is important to keep in mind when configuring your parallel ATA devices. We've prepared three sample IDE configs at the bottom of this page.

A parallel ATA drive's master/slave setting is almost always configured with a series of small plastic jumpers. Put the jumper over one pair of pins, and the drive is set to master. Put it over the other, and it's set to slave. It's that simple.

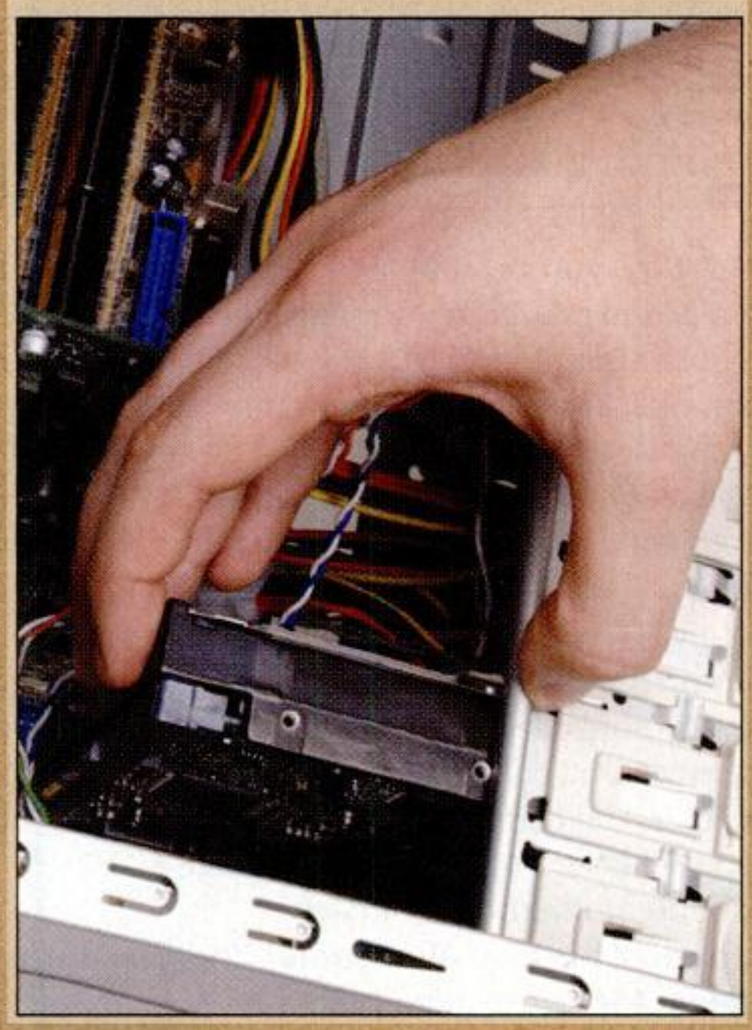
Serial ATA

Configuring Serial ATA drives is much easier than parallel ATA drives. There are no annoying master/slave settings, and you don't have to worry about drives sharing channels. Your PC can access any Serial ATA drive at any time, no matter what other drives are being accessed.

Step 13: Mount the hard drives

This is another step that varies on a case-by-case basis. For most case enclosures, you'll want to slide your hard drives into one of the 3.5-inch bays with the connector side facing out. Once the drives are in the bay, line up the holes on the side of the drive with the holes in the bay, and screw the drive into place. We recommend using two screws on each side of the drive; more is overkill, and less is dangerous because your drives won't be stable enough.

Some newer cases use a tool-less mechanism to lock the hard drives into place. Installing your drives in these is simple. All you have to do is put the drive in the bay and slide the locking mechanism into place until it clicks. Easy, huh?



Three Tried-and-True Parallel ATA Drive Configurations

Modern systems have several IDE adapters, which makes IDE configuration decisions quite perplexing. Here are the three most common optical drive configurations, and pros and cons for each.

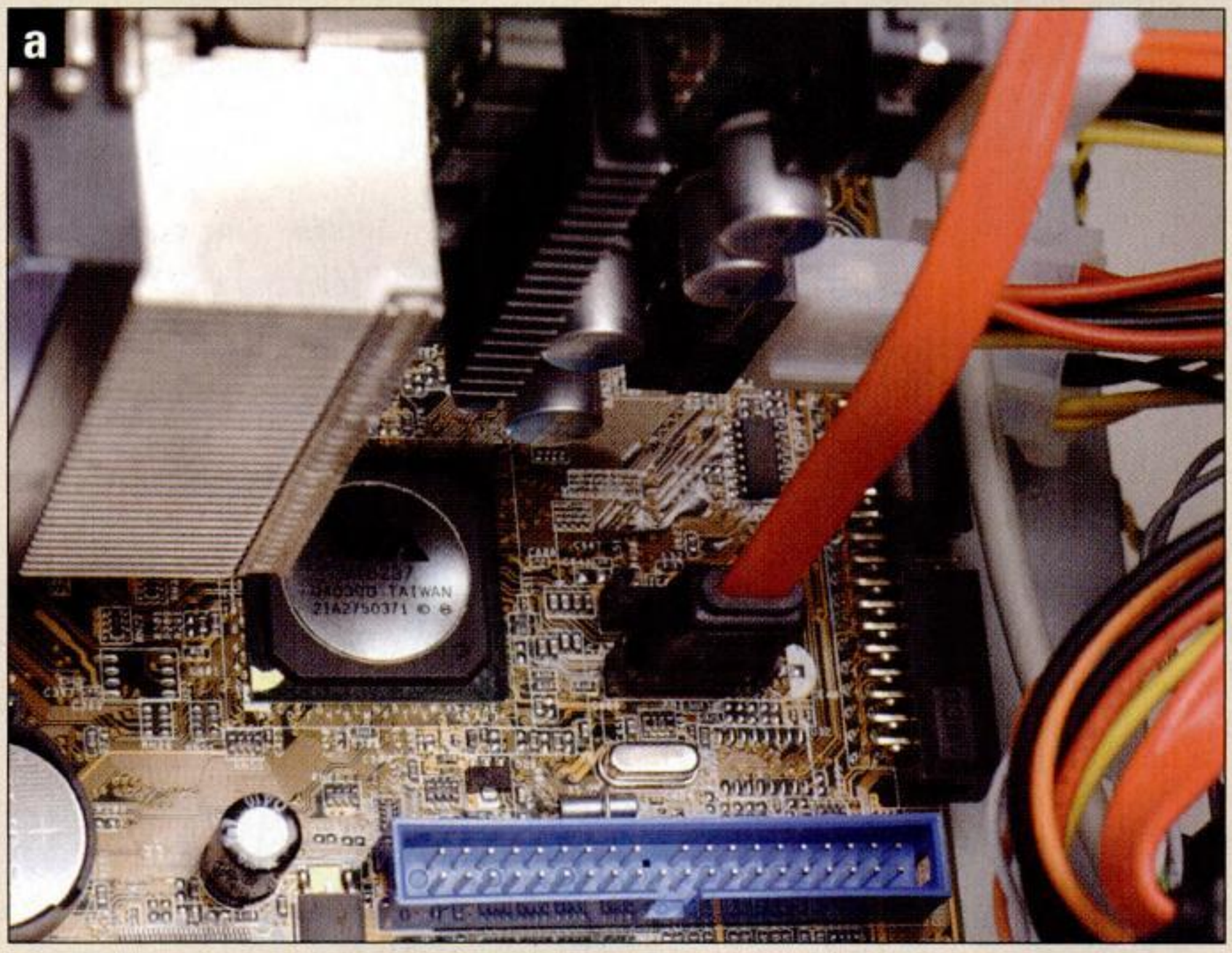
HARD DRIVE AND OPTICAL DRIVE ON SEPARATE CHANNELS: This is an extremely common configuration. Because each drive has its own channel, the system can access both drives at the same time. The performance is especially appreciated when you're copying large volumes of data from an optical drive to the hard drive.

HARD DRIVE ON ONE CHANNEL, TWO OPTICALS ON THE SECOND CHANNEL: This setup places your hard drive on the primary channel while two optical drives share the secondary IDE channel. This setup provides great optical drive to hard disk performance for either optical drive, but is practically useless for optical-to-optical disc copying because both drives share the same channel.

EACH DRIVE ON ITS OWN CHANNEL: In a perfect world, each hard drive and optical drive has its own IDE channel. All drives can work simultaneously, preventing any confusing situations like, say, using one optical drive for CD copying, but the other for disc-to-disc copies because of IDE channel concerns. If you don't plan on using RAID, you can use these ports for secondary hard drives or optical drives.

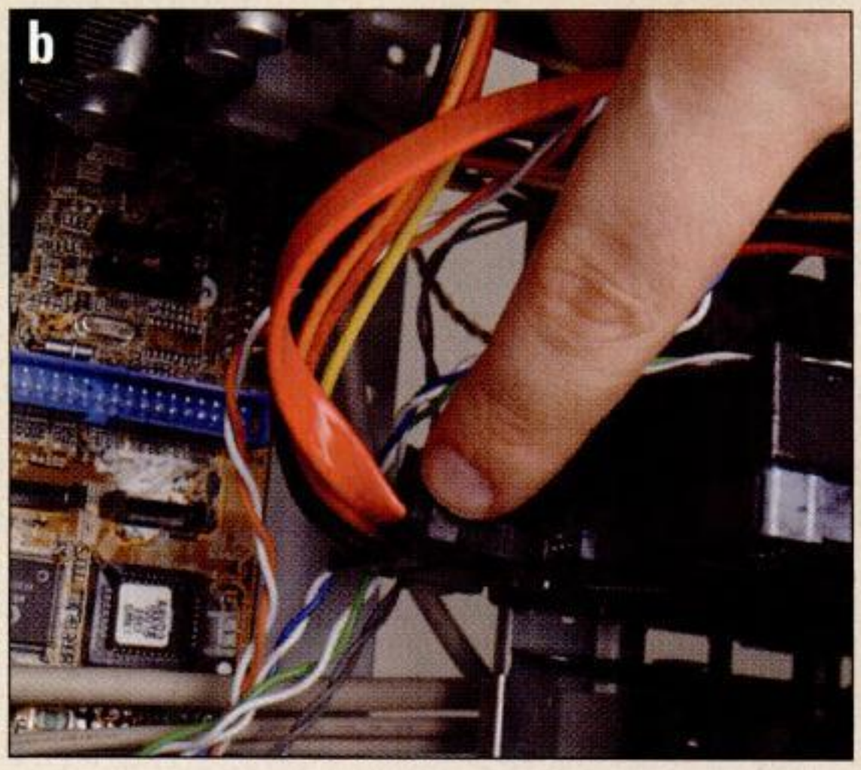
Copyrighted material

Step 14: Connect your hard drives



Next up, you need to feed data connections and power to your hard drives. If you're using Serial ATA drives, this is simple. Just plug each drive into one of your motherboard's Serial ATA ports **(a)**. We recommend using the ports built into your mobo's chipset for the drive that will contain Windows—you can find out which ports on the motherboard correspond to that Serial ATA controller by consulting your manual **(b)**. Be very careful connecting your Serial ATA cables. The connectors are easily broken, so make sure you don't put pressure on the motherboard or hard drive connectors. Also, some Serial ATA drives offer both a Serial ATA and old-fashioned four-pin Molex power connector. DO NOT USE BOTH POWER CONNECTORS! Use one or the other. It doesn't matter which.

Connecting parallel ATA drives is equally simple. With the old-style parallel ATA ribbon cable, you need to make sure all of your drives are within 18-inches of the motherboard's ports, and you need to be very careful not to bend any of the pins on either the mobo or the hard drive. Line up the cable with the port, and using even pressure, push the cable into the port. If you are going to install Windows on a parallel drive, we definitely recommend using the native parallel ATA ports. If you use a RAID controller or ports that use non-standard drivers, you'll have to endure the hassle of installing mass storage controller drivers every time you reinstall Windows.

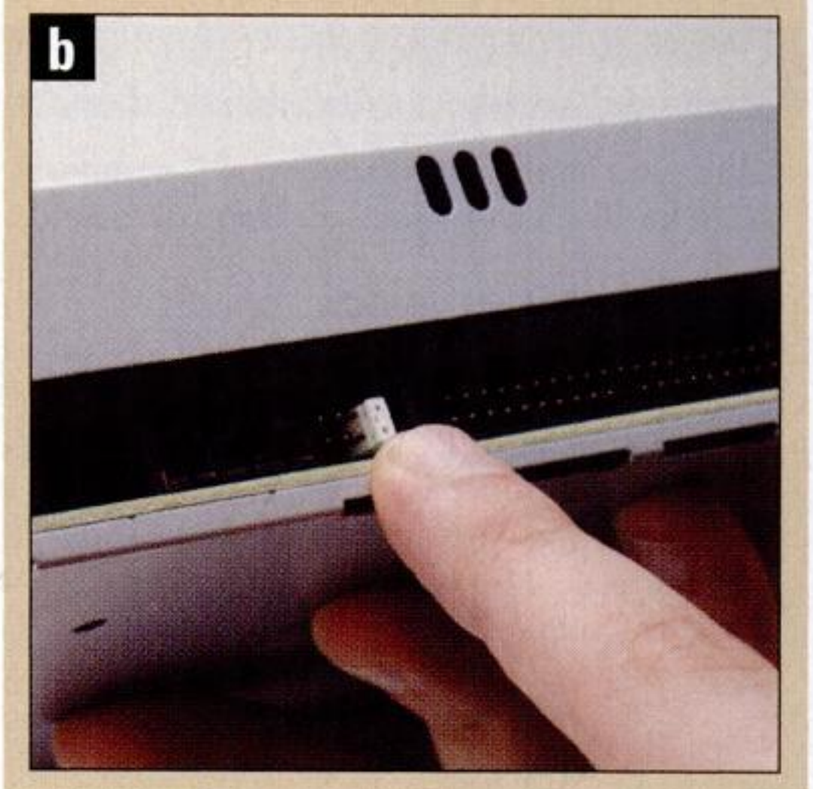


Caution! ***"Do not use both power connectors on your Serial ATA hard drives!!"***

Step 15: Prep optical drives

Now it's time to get your optical drive (or drives) ready for your case. If your case uses any kind of drive rails, you need to attach them now. Attaching drive rails can be tricky. If you don't place them properly, your drive's front bezel won't be aligned with the front of the case. The only way to make adjustments is through trial and error. You'll have to mount the rails on the drive, slide it into the case, and give it the ol' eyeball. It may take a try or two to get the drive perfectly aligned.

Next, you need to make sure that your optical drives are configured with the proper master/slave settings. Most optical drives have labels on the top **(a)** which will show you the proper configuration for your jumpers. (Backtrack to step 12 if you need a refresher on configuring jumper settings **[b]**.)



Copyrighted material

LUCAS Arts

POWERED BY gamespy

SEE THE MOVIES ON DVD.
THEN LIVE THE BATTLES.

STAR WARS BATTLEFRONT

AVAILABLE NOW!

FIGHT THE GREATEST WARS IN THE GALAXY
ANY WAY YOU WANT.

www.starwarsbattlefront.com

Available for console systems and PC-CD.

TEEN
T
Violence
ESRB CONTENT RATING www.esrb.org

GAME EXPERIENCE MAY CHANGE DURING ONLINE PLAY

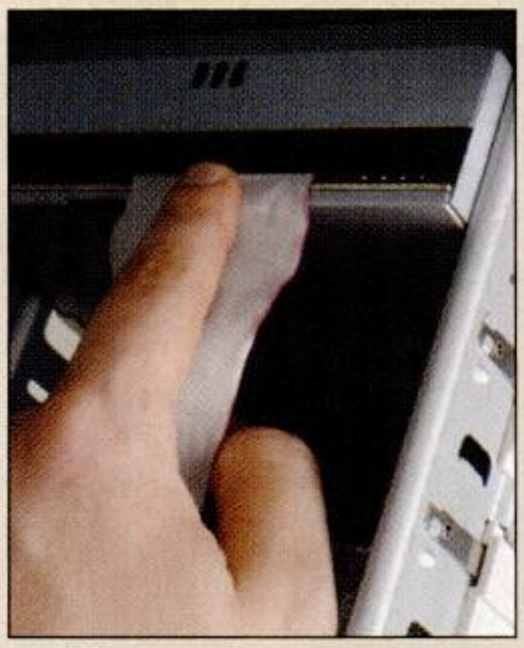
LucasArts and the LucasArts logo are registered trademarks of Lucasfilm Ltd. Star Wars Battlefront is a trademark of Lucasfilm Entertainment Company Ltd. © 2004 Lucasfilm Entertainment Company Ltd. or Lucasfilm Ltd. & ® or TM as indicated. All rights reserved. GameSpy and the "Powered by GameSpy" design are trademarks of GameSpy Industries, Inc. All rights reserved. All other trademarks, product names and company names or logos are the property of their respective owners.

Copyrighted material

Step 16: Mount the optical drives

Once again, it's time to mount drives in your case, but this time, they're optical. Before you can slide your DVD and/or CD drives into your case, remove the front slot covers from your case bezel. You shouldn't have to apply strong force to get it loose. If you're having difficulty, check your case manual.

Step 17: Connect the optical drives

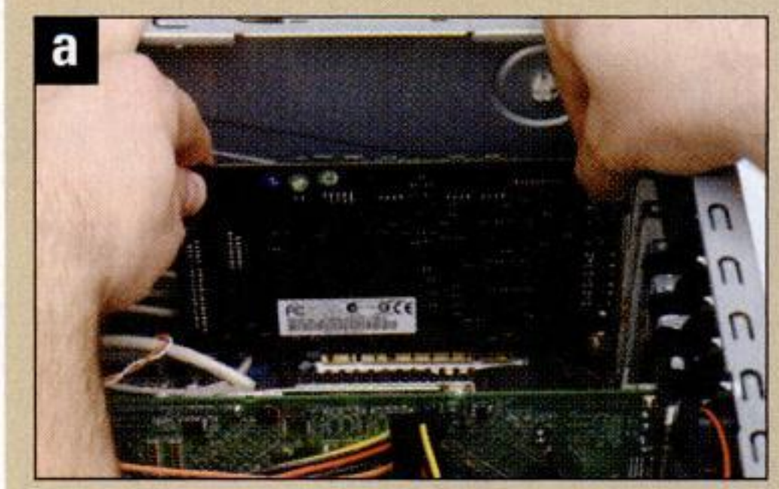


Just like hard drives, optical drives need to be connected to a mobo and a power source to work. Although we've heard rumors of the existence of Serial ATA optical drives, we have yet to actually see any, and don't expect to before the end of this year. So for the time being, it's strictly parallel ATA cables for the optical drives.

The connections for your optical drives are exactly like those for parallel ATA hard drives, so attach the cables in the same way—line up the cable and apply even pressure to both sides of the connector. You'll also need to run a four-pin Molex power connector from the power supply to each of your optical drives. Maximum PC Lab technicians generally no longer bother with the analog CD audio connector or the SPDIF on their optical drives. They're not necessary now that all drives can digitally extract CD audio.

Step 18: Install the rest of your cards

We're almost there. Soundcards, network cards, TV tuner cards, and any other type of card you might want to install should be plugged into your rig now. Installing PCI cards is easy. First, remove the slot cover from your case for the PCI slot you want to use. It doesn't really matter which PCI slots you use for your devices. Next line the card up with the slot **(a)**. Once you push it into place, lock it down using screws or your case's latches **(b)**.

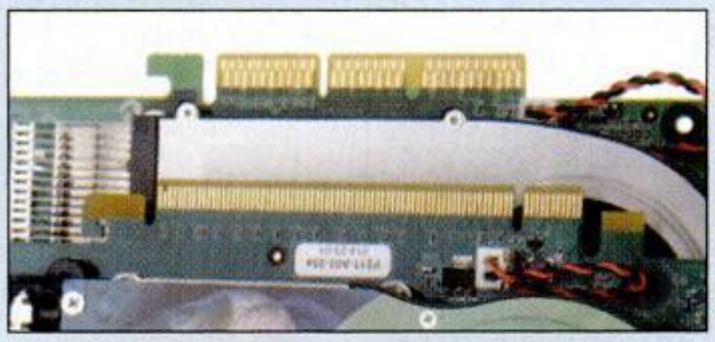


The Secret Serial Life of PCI Express

Why much faster data rates make PCI Express a must-have technology.

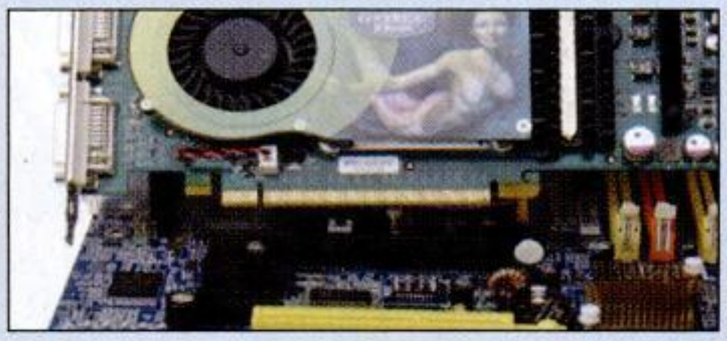
The PC world is going serial. First it was Serial ATA and now it's PCI Express. That's because it's far easier to ratchet up bus speeds when a signal is sent over a few wires rather than the dozens of wires used in parallel connections. The PCI Express graphics slot will initially be able to transfer 4GB of data in both directions. (Compare that to the 8x AGP slot, which can reach just 2.1GB/s in one direction.)

For all the rest of your add-in cards, the tiny x1 (pronounced *bi-1*) connector almost doubles the bandwidth of PCI from 133MB/s to 250MB/s. To add more bandwidth, chipset and board designers simply increase the number of "lanes" to each connection. Eventually motherboards will have x4 slots for add-in cards which will support up to 1GB/s of traffic.



A PCI Express card (bottom) has a single row of connectors, while an AGP card (top) has two rows of connectors.

Almost all PCI Express mobos use the new ATX 2.0 power spec (white). PCI Express graphics cards use a new 6-pin power connector (black) as well.



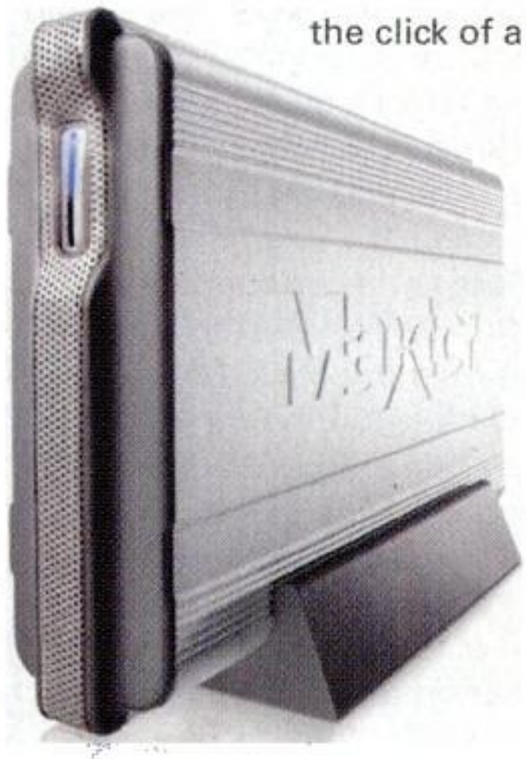
Inserting a PCI Express graphics card is really no different than installing an AGP card.

Copyrighted material

© Maxtor Corporation 2004. Maxtor and What Drives You are registered trademarks, and Maxtor OneTouch is a trademark of Maxtor Corporation. All other trademarks are the property of their respective owners. GB means 1 billion bytes. Total accessible capacity varies depending on operating environment. Maxtor OneTouch is an appropriate part of your overall data protection plan.
*File capacity figures provided by Jon Peddie Research. For details see jonpeddie.com

It's your favorite shot. Keep it safe.

Your stuff is important. Save it, store it, back it up with the push of a button. The Maxtor OneTouch II is the only external hard drive with room for up to 200,000 photos*, new software that lets you easily retrieve backed up files with the click of a mouse, and Maxtor DriveLock™ for added security. Think of it as your computer's new best friend.



***Maxtor OneTouch™ II* EXTERNAL HARD DRIVE**

The perfect place for all the things you love

up to 300GB · FireWire · USB 2.0 · maxtor.com

Maxtor®

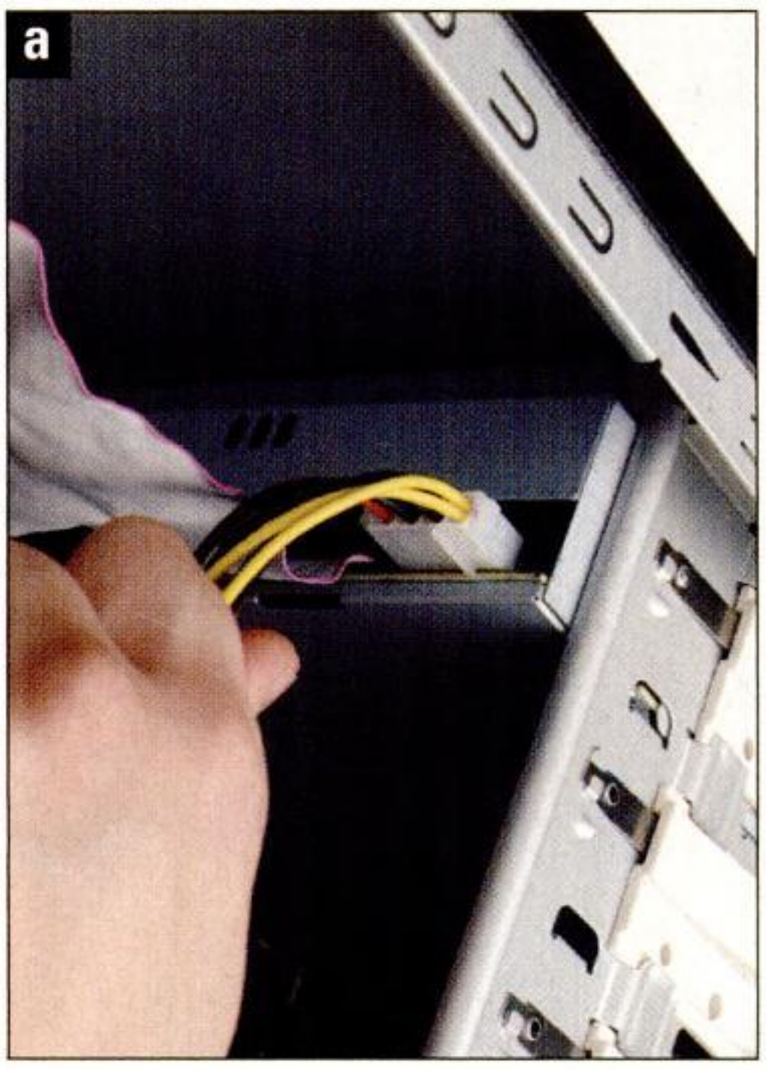
What drives you.®

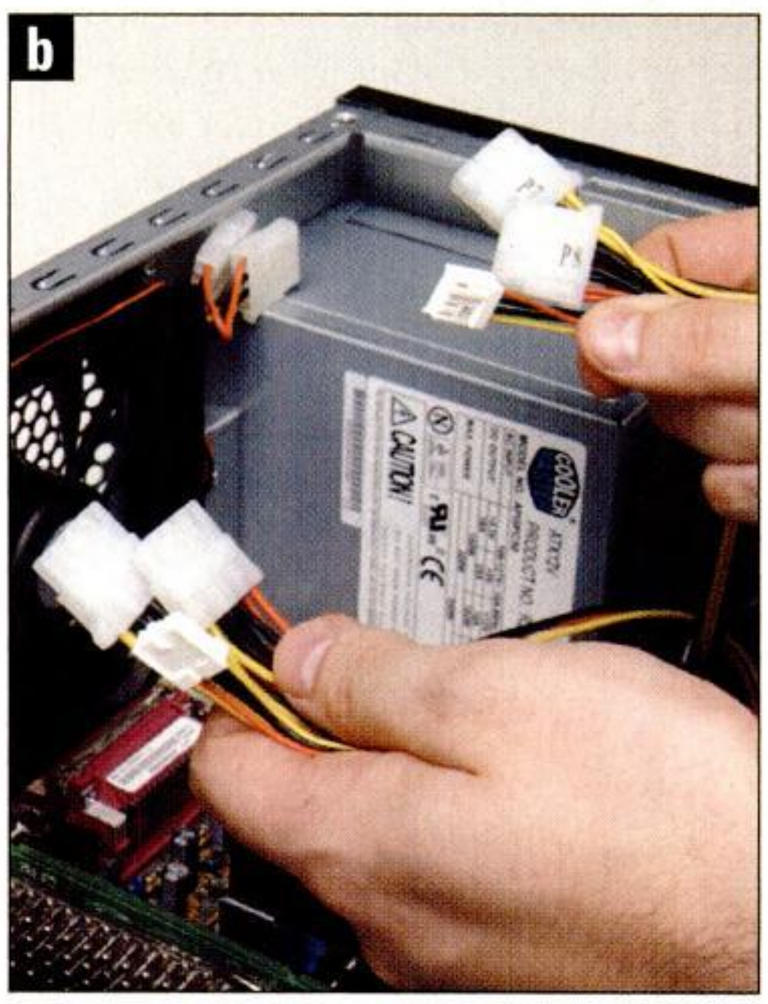
Available at Best Buy, CompUSA, Fry's, Microcenter, Office Depot, and Staples and online at CDW, Dell, Insight, Newegg, PC Connection, and Tiger Direct

Copyrighted material

Step 19: Last minute housecleaning

It's exciting when you've installed the last piece of hardware, but you're not totally done with construction until you've done a thorough double-check. You need to ensure that each component that requires power is connected to the power supply **(a)**, that all your fans have power, and that your cables are tidy **(b)**—tucking them out of sight will not only make the interior of your machine more attractive, it will also improve airflow and thus cooling in your case! Get this right now, and you'll make life a lot easier on yourself.





How to Tweak Your BIOS for Performance and Reliability

Even the smallest changes to the BIOS can have a big effect. Here are our two favorite BIOS tips. Keep in mind that each BIOS is a little different, so you may need to dig around in your BIOS to find the appropriate settings.

ADJUST YOUR CAS LATENCY

Manually tweaking your memory settings can yield big performance gains. The memory timing menu is usually located in the Advanced Chipset screen or a submenu of this screen. Before you can adjust the memory timing, you must change the setting for "Configure SDRAM Timing" from the default of SPD to User **(a)**. SPD uses the settings built into a chip on the memory modules to determine the memory timings. User lets you select your own timings. If you need to determine the standard timing values for your memory modules and the information isn't available in the BIOS, check the memory vendor's web site for the modules' data sheet.

Memory speeds are described in two different ways: frequency (measured in MHz) and latency (how quickly the module can send data after receiving a request). DDR SDRAM is available with CAS latency values of 2.5 and 2.

To improve performance, try using a lower latency value. For example, if your memory has a CAS latency value of 2.5, try 2 instead. If the system won't run properly, go back to the default CAS latency and try other adjustments.

a

DRAM Timing Control

Current Host Clock	133 MHz
Configure SDRAM Timing by	SPD
SDRAM Frequency	Auto
SDRAM CAS# Latency	Auto
Row Precharge Time	Auto
RAS Pulse Width	Auto
RAS to CAS Delay	Auto
Bank Interleave	Auto
DDR DQS Input Delay	Auto
SDRAM Burst Length	4 QW
SDRAM 1T Command	Disabled
Fast Command	Normal
Fast R-2-R Turnaround	Disabled

ADJUST YOUR MEMORY TIMING

Depending on the BIOS your system uses, you can also adjust other memory timing factors, such as Row precharge time, RAS pulse width, and RAS-to-CAS delay **(b)**. Row precharge time (also referred to as tRP) refers to the amount of time needed (in clock cycles) to activate the memory bank. RAS pulse width (tRAS) refers to the amount of time (in clock cycles) to leave the row of memory open for data transfers. RAS-to-CAS delay (tRCD) refers to the amount of time needed to switch to a different row of memory to access data not found in the current row. For maximum speed, these should be set as fast as possible (smaller values are faster). Try changing one setting at a time, and testing the stability with a memory benchmark like *Memtest86* **(www.memtest86.com)**.

b

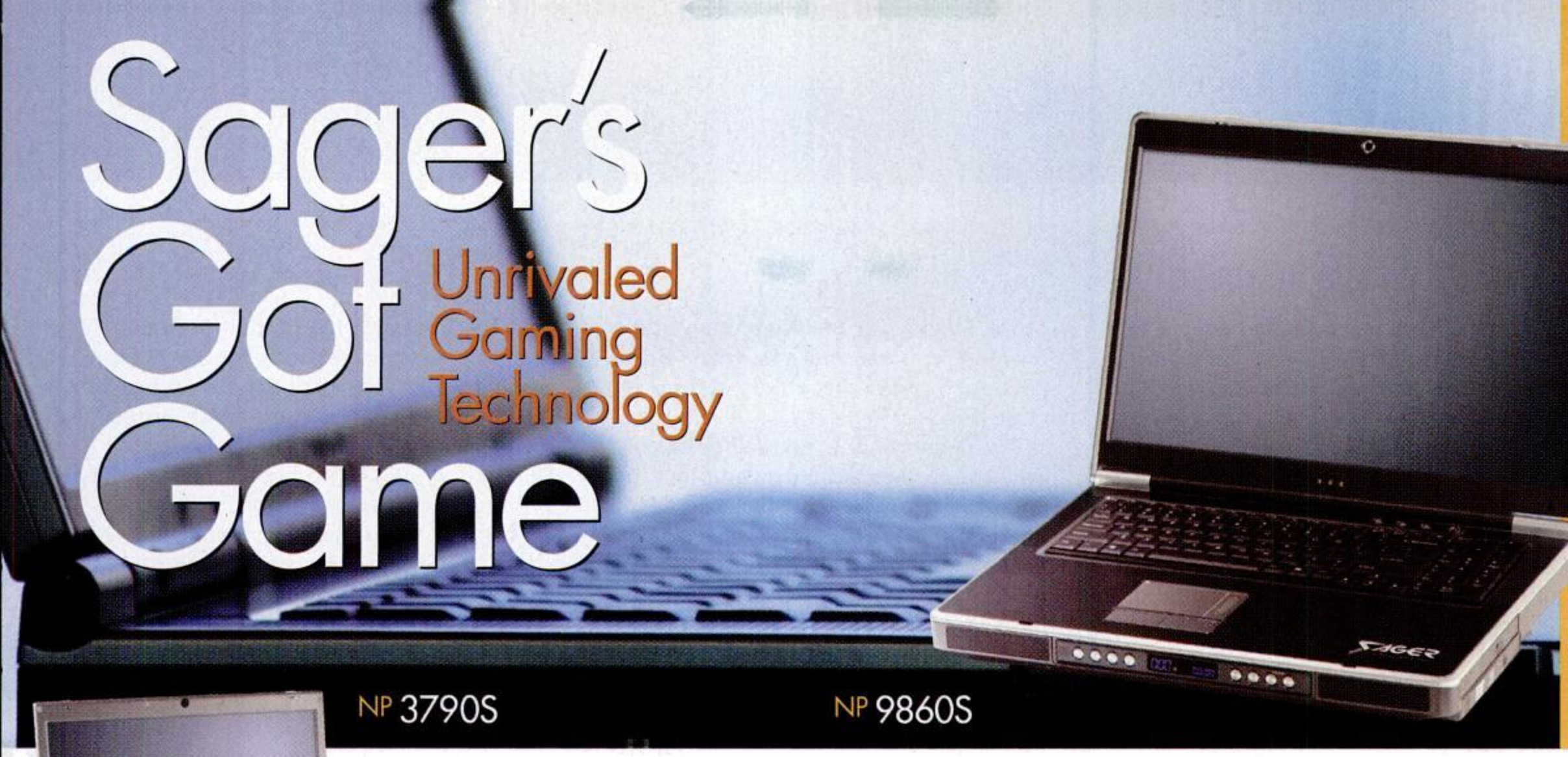
DRAM Timing Control

Current Host Clock	133 MHz
Configure SDRAM Timing by	User
SDRAM Frequency	Auto
SDRAM CAS# Latency	2
Row Precharge Time	2T
RAS Pulse Width	5T
RAS to CAS Delay	2T
Bank Interleave	4-Way
DDR DQS Input Delay	Auto
SDRAM Burst Length	8 QW
SDRAM 1T Command	Disabled
Fast Command	Ultra
Fast R-2-R Turnaround	Enabled

Copyrighted material

Sager's Got Game

Unrivaled Gaming Technology



NP 3790S

NP 9860S

Take your game to the next level!

Go beyond the limits of the conventional office. Sager notebooks provide not only the best business performance, but also the best gaming performance available. Loaded with the latest components, access today's business and gaming software with ease. Sager's power, speed and graphics surpass all others.

NP3790 FEATURES

- ATI MOBILITY™ RADEON™ 9700 with 128MB DDR delivers cutting-edge performance for 3D gaming and multimedia business applications.
- Built-In Digital Video Camera makes video chat and video conferencing easy.
- Built-In 4-in-1 Card Reader supports SD/MMC/ MS/MS Pro provides the fastest and easiest way to transfer your digital media.
- Using optical SPDIF output (5.1CH for DVD Movies) combined with the TV-out port you can watch DVDs on long trips or hook right into your home theater system.
- Communication on-the-go with integrated 802.11g Wireless LAN, V.90 fax/data Modem and 10/100/1000 LAN.

- **15.4" WUXGA Active Matrix Display**
- **Intel® Centrino™ mobile technology**
  - **Intel® Pentium® M Processor 735 (1.70GHz, 2MB L2 Cache, 400MHz FSB)**
  - **Intel® PRO/Wireless 2200BG LAN 802.11b/g**
- **128MB DDR ATI MOBILITY™ RADEON™ 9700 AGP 8X Graphics**
- **512MB PC2700 (333MHz) DDR SDRAM**
- **60.0GB 5400RPM Ultra ATA100 Hard Drive**
- **8X DVD²/24X10X24 CD-RW² Combo Drive**
- **Built-In Digital Video Camera**
- **Built-In 4-in-1 Card Reader**
- **4 Built-In Stereo Speakers**
- Integrated Fax Modem⁴ and 10/100/1000 Ethernet
- Microsoft® Windows® XP Home Edition
- Sager's Umbrella Protection Policy

$1795

NP9860 FEATURES

- NVIDIA® GeForce™ Go 6800 PCI-Express™ Graphics Module with 256MB DDR2 Memory delivers new levels of performance, and the most vibrant, life-like graphics ever experienced on a mobile PC.
- Dual Channel DDR2 System Memory supports 400/ 533MHz, provides the best match for Intel® Processors and enables power efficiencies for data intensive business, multimedia, and gaming applications.
- Dual Optical Device bays allow this system to be customized with 2 CD-ROM devices for fast backup.
- The front panel Audio DJ CD player control with separate power switch lets you play your favorite music CD or MP3 while on the go.
- TV Tuner with Multi-Function Remote Control, so you will never miss any of your favorite TV shows again.
- Hardware Raid boosts HDD Speed with Raid 0 or mirror backup your data with Raid 1.
- Built-In Enhanced Digital Video Camera makes video chat and video conferencing easy.
- Virtual Eight channel external audio outputs eliminate the need for a decoder equipped speaker system.

- **17.0" Wide Viewing Angles WSXGA+ Active Matrix Display with Super Clear Glare Type Screen**
- **Intel® Pentium®4 Processor 560 with HT Technology (3.6GHz, 1MB L2 Cache, 800MHz FSB)**
- **256MB DDR2 NVIDIA® GeForce™ Go 6800 PCI-Express™ Graphics**
- **1024MB Dual Channel DDR2 SDRAM**
- **60.0GB 7200RPM Ultra ATA100 Hard Drive**
- **4X2X8 DVD+-R/RW¹ Dual-Mode Drive**
- **Full Size Keyboard with Numeric Keypad**
- **Built-In TV Tuner with Remote Control**
- **Front Panel Audio DJ with Separate Power Switch**
- **Hardware Raid 0,1 Function**
- **Built-In Digital Video Camera**
- **Built-In 7-in-1 Card Reader**
- **4 Built-In Speakers with a Subwoofer**
- **External USB 1.44MB Floppy Disk Drive**
- Integrated Fax Modem⁴ and 10/100/1000 Ethernet
- Microsoft® Windows® XP Home Edition
- Sager's Umbrella Protection Policy

$3195

Sager's Umbrella Protection Policy: 30-Day Money-Back Guarantee. If the equipment does not work as promised, or if you are not fully satisfied, we will issue a full refund upon the return of all original equipment. 48-Hour Repair Promise. For the first 30 days, we'll repair or replace your computer within 48 hours, and we'll pay the 2nd day air return shipping charge. 72-Hour Repair Promise. For the rest of the 1-year warranty period, if it takes more than 72-hours to repair your computer, we'll pay 2nd day air return shipping charge. 1-Year Parts and Labor Limited Warranty. Lifetime Toll-Free Technical Support. Umbrella Policy Applies to End Users in the United States of America and in Canada only and 48-Hour/ 72-Hour repair policies apply to hardware only. Software problems may take longer. **Extended Warranty Available:** Check out this comprehensive package of service/support. **Special Pricing:** Government, corporate and other special rates are available. Please call for details. GSA Contract # GS-35F-4168G **Business Leasing Available:** Get your dream notebook with low monthly payments! Sager Corporate Offices 18005 Cortney Court, City of Industry, California 91748 Tel: 626.964.8682, Fax: 626.964.2381 Hours: Monday-Friday 7:30a.m. - 6p.m. Saturday 9a.m. - 3p.m. (PST) American Express, VISA, MasterCard & Discover Credit Cards Accepted - No Surcharge. Cashiers Checks Welcomed. ©2004 by Midern Computer, Inc. All rights reserved. Intel, Pentium, Intel Inside, and the Intel Inside logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. All company and/or product names mentioned herein are trademarks and/or registered trademarks of their respective companies. The DVD upgrade-kit for Sager Notebooks is licensed through the CLEVO Company. All color LCD Display screens are simulated for artistic purposes. Prices and specifications are subject to change without notice. Opened software and shipping charges are non-refundable. 30-Day money back guarantee does not include freight or shipping and handling charge. Notes: 1,2,3: DVD-R/RW, DVD-ROM, and CD-RW drives list a variable read rate. DVD-R/RW and CD-RW write and re-write speeds vary and list only the maximum possible speed. Actual DVD-R/RW, DVD-ROM, CD-RW speeds will vary and are often less than the maximum possible speed. 4: Maximum Transmission speed of up to 53Kps when downloading and 33.6Kps when uploading data. Actual speeds may vary depending on line conditions and current FCC restrictions.

intel inside HT pentium 4

For up-to-the-minute pricing and to order online, 24 hours a day:

www.sagernotebook.com

Call us at:

800.669.1624

SAGER
THE PORTABLE POWER PEOPLE

Copyrighted material

Step 20: Configure your BIOS

Now it's time to configure your system's BIOS. Connect your monitor, keyboard, and mouse and power up your machine. Make sure you press the appropriate key to get into your BIOS—it's different for different BIOS types, but you should see a prompt when you first boot your PC. There are two main settings you need to tweak before you can start installing Windows: the CPU speed and the boot order. Once your machine is up and running, you can perform some more advanced tweaks (see the sidebar on page 44).

As a general rule, adjusting the CPU speed is as simple as entering the appropriate menu, usually called CPU Speed or SoftBIOS, and setting the CPU speed to automatic.

You also need to set your BIOS to boot off of the hard drive first, and then the optical drive, if it can't find a bootable hard drive. Look for a setting labeled Boot Order (it's usually in Boot Options) and change the default order so that your main hard drive is first. This will allow you to boot off the optical drive to install Windows, but avoid waiting for the optical drives to spin up every time you boot the system after Windows is installed.

Caution! *Be careful when you configure your BIOS! A misstep can fry your CPU.*

Step 21: Install Windows XP

To install Windows, all you need to do is pop the CD-ROM into the drive, then press the "any" key when you see a screen prompting you to "Press any key to boot from CD."

After your system has booted off the CD, the installer will start the text mode part of the setup. If you want to install Windows on a SCSI drive or RAID array that XP doesn't include drivers for, you'll need to press F6 and install the drivers as soon as you see the blue screen. Otherwise, wait for the Welcome screen.

Follow the prompts until you get to the partitioning screen. Assuming you're using a new hard drive, you'll need to tell Windows how you want to configure your disk. For maximum performance with XP, we recommend creating one big partition that spans the entire drive. We recommend that you use the NTFS format for your new drive. Remember to always do a thorough format on a brand-new hard drive!

Your PC should now be into the GUI stage of the install. The first screen you'll see is the language options screen. Unless you have a nonstandard keyboard layout, or don't live in the U.S., continue to the next step.

The last major step you have to wade through is the setup of your network. Typical settings work for most cable modems and DSL connections, although you'll need to use manual settings if you have a statically assigned IP address or use some sort of wonky PPPoE connection. After the network is configured, Windows should reboot one last time.

Following the final reboot, you'll be prompted to activate Windows. We recommend that you hold off until you have all the drivers set up for your hardware and everything is working properly.

Chances are, you'll need to go online to fetch all the latest updates, drivers, and patches for your system. Before you connect to the Internet, make sure you enable the built-in firewall. You can disable it after you've patched the OS, but it will protect your rig until you install the critical updates. To enable the firewall, go to the Control Panel, click Network and Internet Connections, then click Network Connections. Right-click on your connection and click Properties. Go to the Advanced tab and click "Protect my computer and network by limiting or preventing access to the computer from the Internet." Now, you can connect to the net a little more safely!

Next, install Service Pack 2. Open *Internet Explorer* and go to **www.windowsupdate.com.** Click the Scan for Updates button and go directly to the Critical Updates and Service Packs section. Install Service Pack 2, and reboot your computer when prompted.

Once the Service Pack is installed, you should install your motherboard's chipset drivers. You should be able to download them from your motherboard manufacturer's web site. They're sometimes called 4-in-1 drivers or the chipset software, depending on the manufacturer. Make sure you reboot when you're done.

Now, go back to **www.windowsupdate.com** and install the latest version of DirectX.

We're almost done. Go to your videocard chipset manufacturer's web site and download the latest version of your videocard's drivers. Once you install them, you'll probably have to reboot.

Install drivers for your soundcard and any other hardware you might have. It's always best to download updated drivers from the manufacturer's web site, but if new drivers aren't being offered, you can always use the drivers off the CD that came with the hardware.

After all your drivers are installed, go back to **www.windowsupdate.com** once again and install all the updates in the Critical Updates section. After the final reboot, you're ready to start using your machine! Did you hear that? You're ready to start using your machine!

GET YOUR DRIVERS HERE!

Without the latest drivers, your machine won't run at its best. Get your chipset and videocard drivers directly from the manufacturers before you build.

CHIPSETS
Via: www.viaarena.com
Intel: support.intel.com
nVidia: www.nvidia.com
SiS: www.sis.com

VIDEOCARD
nVidia: www.nvidia.com
ATI: www.ati.com

Copyrighted material

What to Do If it Doesn't Work

Even *Maximum PC* editors occasionally have problems with their newly built PCs. Here are the three most common PC building problems, and the *Maximum PC*-approved tips for troubleshooting!

Q I turned on my PC for the first time, and nothing happened. The monitor didn't turn on and there were no tell-tale beeps. The power light is on, but no one's home!

A A completely nonresponsive PC could be the result of any number of problems. First, ensure that your case speaker is plugged into the speaker header on the mobo (if your machine is having trouble booting, it will beep to let you know the nature of the problem). If your machine has both onboard video and a videocard it could cause a conflict. Try swapping the monitor to the other VGA output, at least long enough to disable the onboard video.

If you're still having trouble booting, you might have a more serious hardware problem. There's a good chance your CPU isn't properly seated. You need to remove it from the socket, clean it off with 99 percent isopropyl rubbing alcohol and a paper towel, and then reseat it, and reinstall the heatsink. Be careful when you pull the heatsink off of the CPU. You may need to twist the heatsink slightly to get it to release from CPU without forcibly yanking the CPU from its socket.

The last thing to check for is a misplaced motherboard standoff. If you have an extra mobo standoff screwed into your tray, it can short out crucial components of your mobo and render your system unbootable. Unfortunately, the only way to check for extra standoffs is to completely remove the mobo from the case.

Q I'm having trouble getting the Windows installation started. Why won't it start?

A Most likely, Windows is having trouble detecting your hard drive. The first thing you should do is check your cables. Make sure your cables are firmly connected at both the drive and the motherboard end, and that your power cable is plugged into the drive.

If your cables are in good order, you should ensure that your hard drive is plugged into the proper port. Unless you're installing Windows on a RAID array, you should connect your drive to the ports connected to your chipset's native controller. You should also ensure that the proper ports are enabled in your BIOS and are set to the correct mode. Some motherboards allow you to use Serial ATA ports for either standard drives or a RAID array. You'll need to consult your documentation for the specifics.

If for some reason, Windows still doesn't see your hard drive, you may need to install drivers for your controller. To install the drivers, you need to temporarily connect a floppy drive your computer. Connect the floppy, then boot your computer and start the Windows installer. Press F6 when prompted to install your driver. Put the driver floppy that came with the motherboard in the floppy drive and follow the onscreen prompts.

Q I powered up my machine and it's making all sorts of beeping noises! What do they mean?

A Beeping noises generally mean there's a problem with a crucial piece of hardware. They can mean that your memory isn't properly inserted, there's a problem with your videocard, or even that your keyboard isn't properly plugged in. Error codes vary from mobo to mobo; consult your motherboard manual to decode the specific beep code you're hearing. ■

The 7 Dos and Don'ts of PC Building

DON'T Close the PC case before your first boot! Doing so will invoke Murphy's Law, guaranteeing that something will go wrong and you'll just have to open up the case again.

DO Write down the model numbers and serial numbers of all your internal hardware in case you need to download documentation or call technical support later when the PC case is closed.

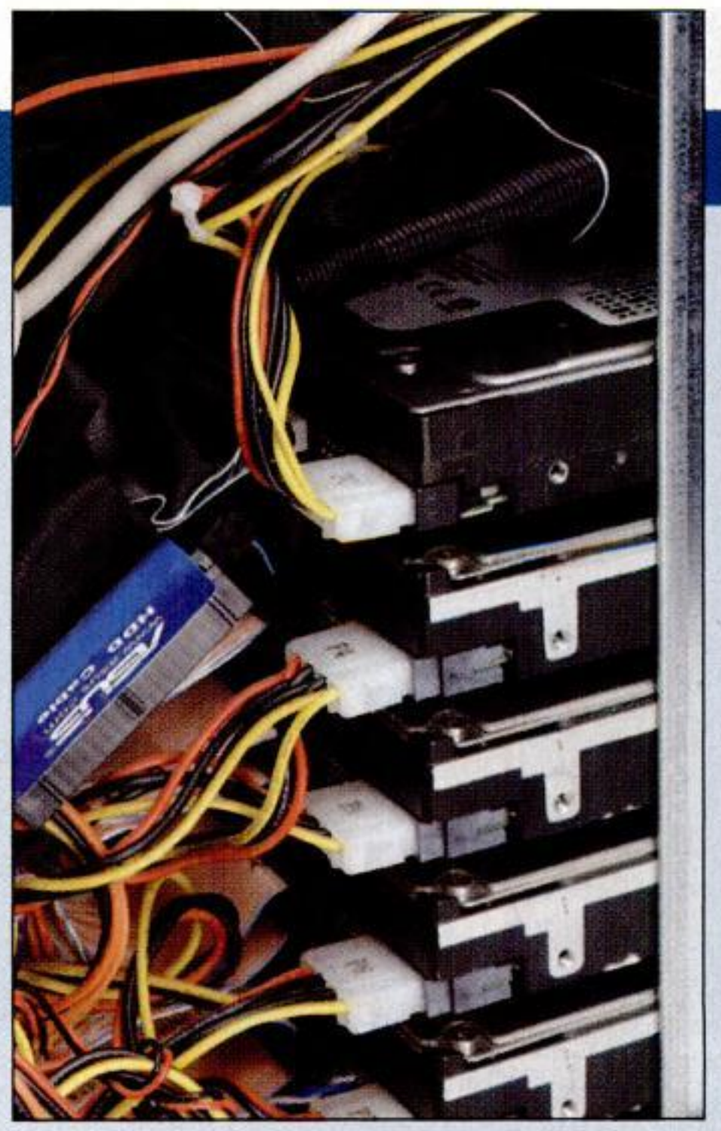
DON'T Work inside the PC while the power is on.

DO Check your case fans often for gunk buildup. A fan can't do its job if it's clogged with cat hair!

DO Screw in your hard drives and optical drives on both sides. It helps stabilize the drives and reduce noise.

DO Make sure you have an adequate power supply for your hardware. A 350W power supply is the bare minimum today. You need 450W or higher for a fully loaded gaming rig.

DON'T Position your hard drives too close together! If you're using more than two drives, allow some room for airflow between them. Heat kills!



Copyrighted material

On the Frontlines, There is but One Commandment.

Thou Shalt Kill.

WARHAMMER 40,000

DAWN OF WAR™

www.dawnofwargame.com

MATURE 17+

M

CONTENT RATED BY ESRB

PC CD-ROM SOFTWARE

GWI

PLAYS BEST ON ALIENWARE

POWERED BY gamespy

relic ENTERTAINMENT

THQ

www.thq.com

© Copyright Games Workshop Limited 2004. Dawn of War, Dawn of War logo, GWI, GWI logo, Games Workshop, Warhammer, Warhammer 40,000 Device, and all associated names, insignia, marks, and images are either ®, ™ and/or © Games Workshop Ltd 2000-2004, variably registered in countries around the world. Used under license. All Rights Reserved. GameSpy and the "Powered by GameSpy" design are trademarks of GameSpy Industries, Inc. All rights reserved. Alienware and the Alienware logo are registered trademarks and trademarks of Alienware Corporation. THQ and the THQ logo are trademarks and/or registered trademarks of THQ Inc. Relic and Relic Entertainment are trademarks and/or registered trademarks of Relic Entertainment Inc.

Copyrighted material

TRAUMA KIT 2004

Here's everything you need to resuscitate an illin' PC

It's 8:36 p.m. on Sunday when the call comes in on the squawk box: "Emergency 51, RP reports head-on collision between random blue screens and lockups on a 2001 PC at the corner of Maple and School streets. PC is needed to complete a critical assignment."

There's no time to ask questions. You grab your trauma box, spare power supply, and laptop, and roll Code 3 to your mom's house.

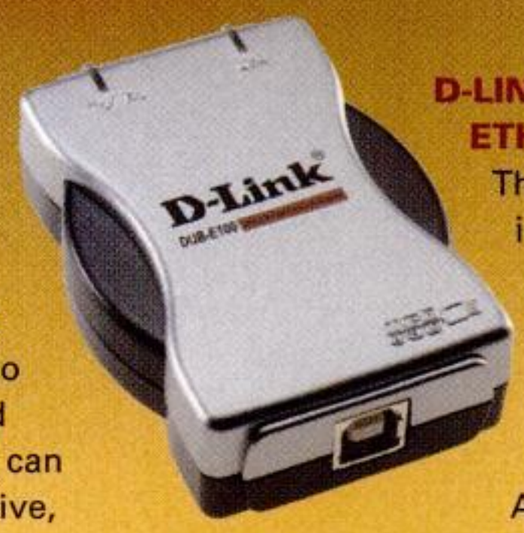
Responding to PC distress calls is all part of being a power user, so it behooves you to have the appropriate life-saving tools at the ready. We're cracking open Maximum PC's Trauma Kit to give you an idea of the gear our Lab experts consider essential. We don't call out the obvious things such as screws, IDE cables, and drives rails—you already know about that stuff. Instead, we highlight the latest must-have field dressings and ointments that can make your emergency PC repairs easier.

The centerpiece of our trauma kit is the expansive Plano 777 tackle box, available in sporting goods stores everywhere.

Copyrighted material

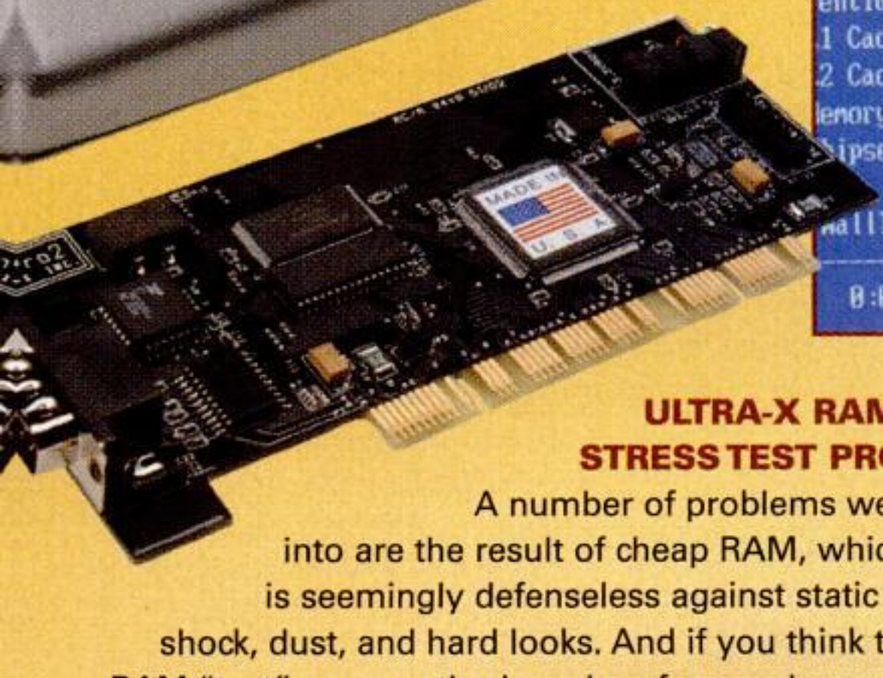
TRAUMA KIT 2004

WESTERN DIGITAL QUICK TESTER: Take the pulse of any parallel IDE hard drive. Besides being able to conduct a full scan of the hard drive's media, the Quick Test can also be used to detect a drive, check the integrity of a parallel data cable, and write zeros to every sector of the hard disk.
$250, www.westerndigital.com



D-LINK USB 2.0 FAST ETHERNET ADAPTER: This device comes in handy when you simply want to get a box up on the LAN without cracking open the case and facing The Attack Of The Dust Bunnies. Even better, D-Link's adapter is USB 2.0 capable so you get zippy speeds for copying files to and from the machine, and it's completely bus powered.
$25, www.dlink.com

SEASONIC POWER ANGEL: You can't use the Angel to fix a computer but you can use it to measure a PC's wattage or amp consumption, check its power factor efficiency, and check its line frequency—any of which could be a contributing factor to your PC problem. You can also use the Power Angel to show mom that plugging the PC, laser printer, mini fridge, and stereo into one 10 amp power strip isn't such a good idea.
$34, www.seasonic.com



```
Memtest-86 v3.1      | Pass  5% #
entiun 4  2806Mhz    | Test 32% ##########
1 Cache     8K 23000MB/s | Test #3  [Moving inv, 8 bit pattern, cached]
2 Cache   512K 19622MB/s | Testing:   80K -  768M  768M
emory     768M  1054MB/s | Pattern:   dfdfdfdf
ipset

allTime   Cached  RsvdMem   MemMap   Cache  ECC  Test  Pass  Errors  ECC Errs
--------  ------  -------  --------  -----  ---  ----  ----  ------  --------
 0:00:45   768M     28M   e820-Std    on    off  Std     0       0         0
```

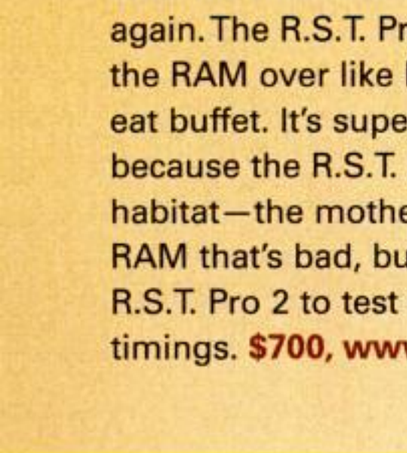
ULTRA-X RAM STRESS TEST PRO 2: A number of problems we run into are the result of cheap RAM, which is seemingly defenseless against static shock, dust, and hard looks. And if you think the RAM "test" your motherboard performs when you boot the machine is enough to catch all errors, think again. The R.S.T. Pro 2 slips into a PCI slot and works the RAM over like Rosie O'Donnell at an all-you-can-eat buffet. It's superior to a stand-alone RAM tester because the R.S.T. Pro 2 tests the RAM in its natural habitat—the motherboard. (Sometimes it's not the RAM that's bad, but the slot.)You can also use the R.S.T. Pro 2 to test the integrity of the BIOS' memory timings. **$700, www.ultra-x.com**

MEMTEST 86: Not everyone can afford a $700 memory tester. *Memtest 86* makes an acceptable substitute. This memory tester boots from a CD and lets you run a basic pattern test on RAM. It's not as comprehensive as the R.S.T. Pro 2, but its price can't be beat: free. Download it, burn an ISO to CD, and say thanks to creator Chris Brady.
Free, www.memtest86.com

ULTRA-X P.H.D. PCI 2: We know the average Emergency Computer Technician won't have Ultra-X's pricey new P.H.D. PCI 2 mobo tester, but it sure can save you a lot of time. The new version plugs into both 3.3 volt and 5 volt PCI slots and lets you boot directly to the card so you can run 150 motherboard diagnostics including tests for the DMA controller, interrupt controller, memory, and CPU. The P.H.D. PCI 2 can also test most of the peripherals hooked up to the PC. It can even boot a system without system RAM. **$995, www.ultra-x.com**

MUST-HAVE ITEMS

We consider these parts and tools the most essential to successful repair and triage



SPARE CPUS: If you're like us, you've probably accumulated a small tray of seemingly useless, low-speed CPUs. Turns out, those suckers are good for something—a simple swap will tell you if the CPU in a sick PC has died. We've press-ganged a S478 Celeron, S370 Pentium III, Slot 1 Pentium II, and Duron into servitude for king and country.

FLUKE NETWORKS MICROSCANNER PRO: Do you have a friend or coworker who just tosses bad network cables back into the bin instead of the garbage can? The MicroScanner Pro tells you how long a cable is and the location of a break, if any. It also will inform you how a cable is wired, where the shorts are, and test for continuity as well. Furthermore, the MicroScanner Pro can generate a tone that can be used to track down hidden LAN cables (provided you have the optional probe for detecting the tone.)
$450, www.flukenetworks.com

ARCTIC SILVER 5: This has become our favorite thermal compound because it holds up so well over time. (Many thermal pastes eventually dry out, which can prevent you from running your CPU at full steam.) Take note, you need only apply a super-thin layer over the surface of the CPU—too much compound can actually impede performance.
$20 for a 12-gram tube, www.arcticsilver.com

Copyrighted material

I/O SHIELDS: Half the systems we work on no longer have their I/O shields—you know, that metal plate that fits around the PS/2, serial, and USB ports and keeps marbles, mice, and Cheez Whiz out of your machine. We collect spare I/O shields from gutted boxes, but mom-and-pop PC stores seem to always have a cardboard box full of them. For 25 cents a pop, it doesn't hurt to stock an assortment.

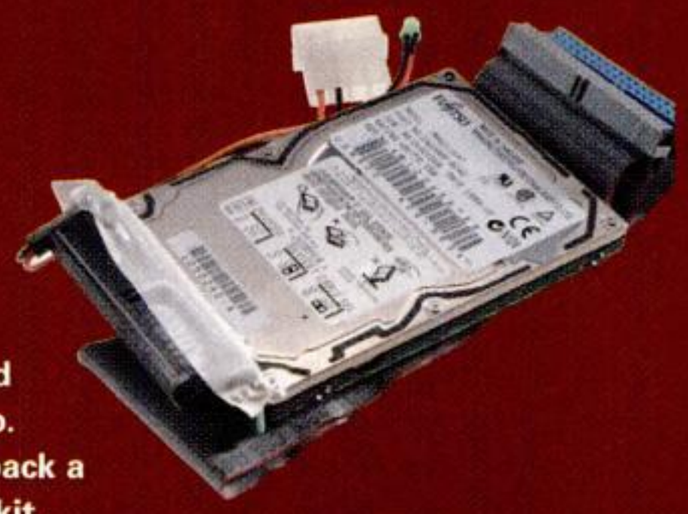
VIDEOCARDS: After all these years we've finally found a use for those old S3 Virge videocards. We use our PCI-based Virge as an alternative form of display should a machine's AGP card be bad, or even worse, if a PC is lacking an AGP slot (think Intel 810 chipset... *shudder*). Of course, we also carry an old GeForce AGP card for AGP component swap-outs.

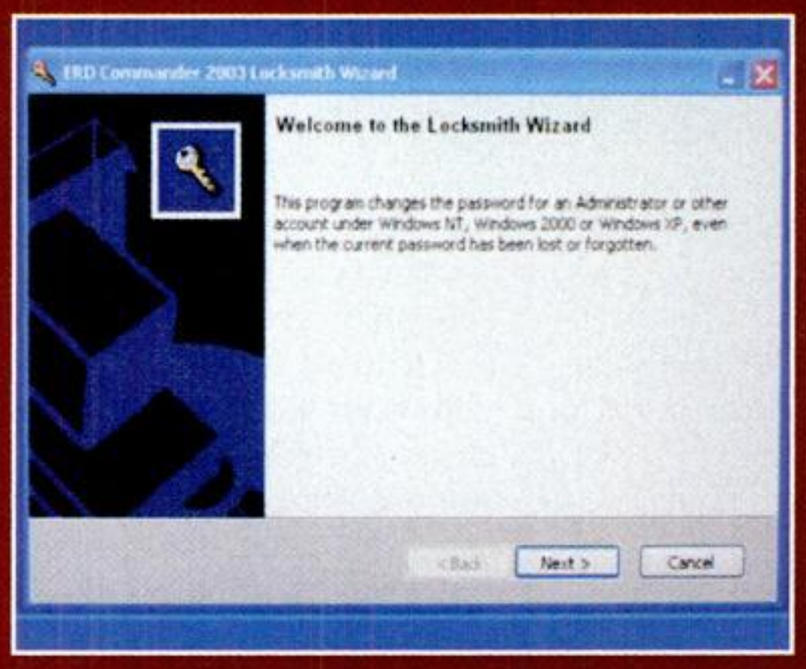
FALCON DUST OFF: Sometimes dust bunnies can't be avoided. That's why we tote a mini can of Dust Off Jr. Blast the offending matter from a safe distance, hold your breath for a Mark Spitz minute, and then move in to perform the repair.
$5, www.falconsafety.com

What do you carry in your box? Got a good tip on a must-have piece of hardware or software for fixing a busted PC? Let us know at input@maximumpc.com.

BartPE: In addition to carrying an array of OS boot disks (don't have 'em? Go to bootdisk.com), you should consider building a *BartPE* disk. Courtesy of Bart Lagerweij, the program allows you to construct your own bootable CD or DVD with the ability to burn discs, scan for viruses, and copy files. Basically a stripped-down version of Windows XP, you can install drivers for various RAID and SCSI devices as well as your favorite utilities. *BartPE* is free, but you may need full versions of some utilities to get complete functionality, and you'll also need a version of your XP install disc with SP1 slipstreamed. Get *BartPE* from www.nu2.nu and follow the directions to install plug-ins for a slick emergency boot disk.

HARD DRIVE: A 20GB or 30GB laptop hard drive with a 2.5-to-3.5-inch converter (about $5) makes a nifty rescue drive. We carry two: one with a clean install of Windows XP for booting a dead system, and a second blank drive to copy important files to. If you don't have one of these, just pack a couple of old 3.5-inch drives in your kit.





WINTERNALS ERD COMMANDER 2003: Never, ever mix a fifth of Stoli with a computing session. It's the perfect recipe for a new PC password that's soon forgotten. Fortunately, *ERD Commander 2003* comes to the rescue with its Locksmith feature. You can reset the password after booting the system from CD. *ERD Commander* is also handy for booting a system with a hosed OS so you can move vital files off the machine or access XP's restore points.
$150, www.erdcommander.com

SNAP-ON SCREWDRIVER: Not as clumsy or unpredictable as an electric screwdriver, the Snap-On ratcheting, magnetic screwdriver is an elegant tool for a more civilized time. It's also probably the best damned screwdriver on Earth.
$50, www.snapon.com

WIHA SCREWDRIVER: If you've ever bunged up a screw with one of those cheap-ass "jewelers" tools, you'll be more than happy to pony up for a set of Wiha precision instruments. Made of hardened alloy steel, these babies are tough to bend.
$24, www.wihatools.com

RAM: If you can't afford the R.S.T. Pro 2 and didn't bother to download *Memtest 86*, you should at least carry some spare RAM. We keep on hand an assortment of PC133, DDR, and RDRAM modules that we've previously tested for integrity. Because there are a few RDRAM systems still kicking around, we also carry a set of C-RIMMs, or continuity RIMMs, that are required to fill the empty slots in an RDRAM system.

Copyrighted material

TRAUMA KIT 2004

IN ACTION

Don't panic! Here's how our trauma kit can save you from three common PC disasters

SYMPTOM: YOUR LAPTOP WON'T BOOT

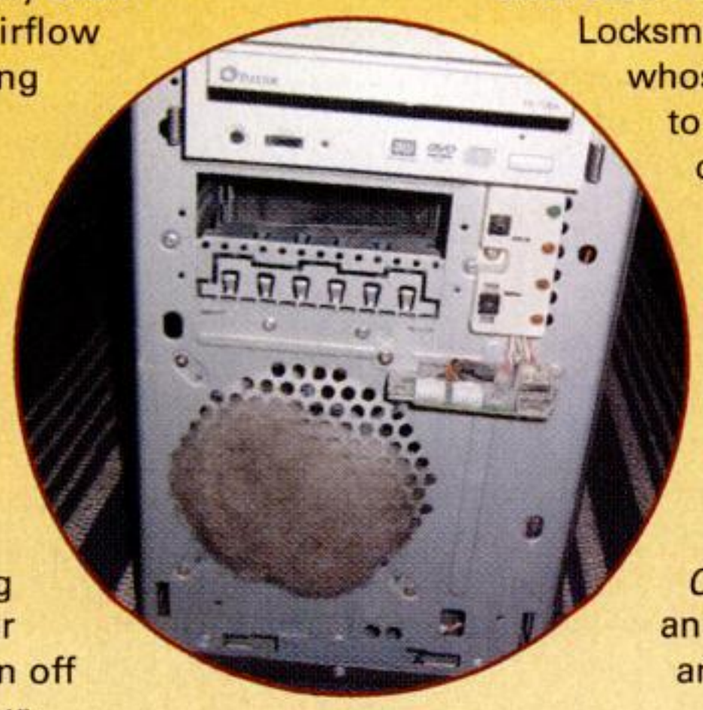
TRIAGE: More than anything else, data rescue should be your first priority. Open the laptop drive bay using the **Snap-On screwdriver.** The hard drive may be affixed to the chassis with tape, so be sure to remove it before attempting to extract the drive (and remember that this might violate your warranty). Gently—*gently*—remove the hard drive from the bay. Place on gurney and wheel over to a working PC. Power down the working PC. Connect the laptop hard drive to the **2.5-to-3.5-inch IDE converter**, and then connect that to the secondary IDE port with a standard IDE cable. Power on the PC. If the laptop drive is clicking or making any other unusual noises, we strongly recommend powering down and turning to a professional data recovery service before the drive's condition deteriorates any further. Otherwise, evacuate all the data.

Now treat the situation like any other unbootable PC. Try to reinstall Windows, and if that doesn't work, pray you're still covered by warranty.

Laptop not booting? Rescue the data first.

SYMPTOM: YOUR PC SPONTANEOUSLY REBOOTS AND/OR SHUTS DOWN

TRIAGE: If it's a hot day, the CPU and/or motherboard may be trying to prevent a meltdown by simply shutting down the PC when its internal temperature exceeds safe levels. Don't just sit around waiting for the PC to cool off so you can power up again—flush out any cruft and improve the airflow in the interim. Using the can of **Dust Off**, clean out the intake and exhaust grills with quick, short bursts. Never depress the trigger for more than a half second or you'll risk spraying moisture over your components. Clean off the surfaces of your expansion cards, CPU, and chipset with the same method. Check for any cables that can be tied off or tucked out of the way to improve airflow.



A half-inch of cat hair blocking your exhaust definitely counts as "cruft."

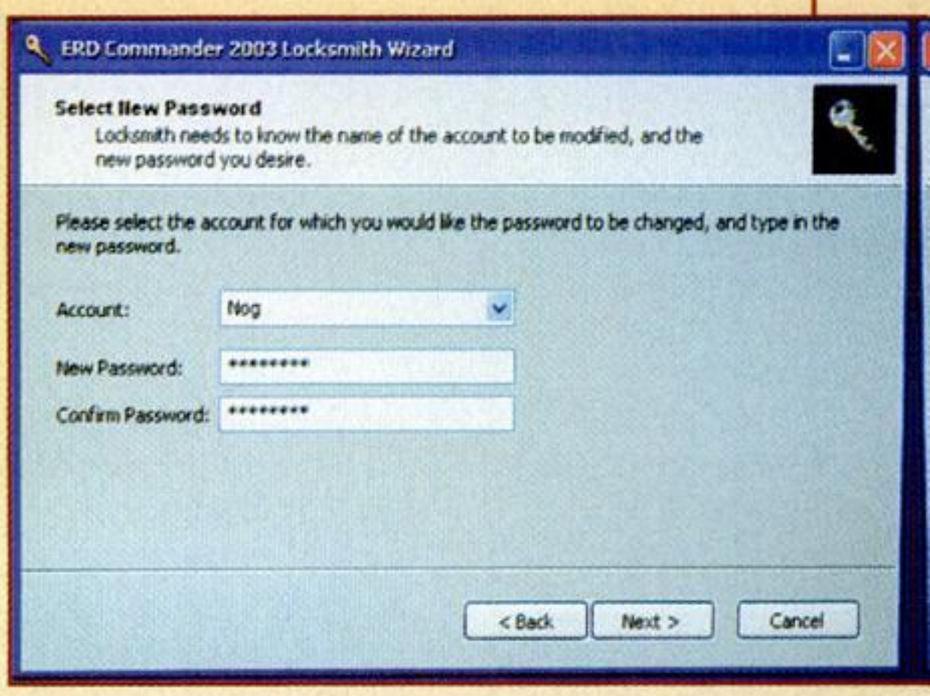
If the problem persists, update your videocard and motherboard chipset drivers to the latest version. Chipset drivers can be found at your motherboard manufacturer's web site, and video drivers will be at either **www.ati.com** or **www.nvidia.com**.

Still having spontaneous reboots? It's time to dig deeper, and your trauma box is well equipped for the task. Pop your CPU heatsink from its mount and clean off the old thermal grease with the **99% isopropyl alcohol** and a paper towel. Then apply a thin layer of **Arctic Silver 5** and remount your heatsink on the CPU.

SYMPTOM: YOU FORGOT YOUR PASSWORD

TRIAGE: The Maximum PC Trauma Response Team is quite familiar with the forgotten password. It can be a major nuisance—unless you're prepared. To remedy the problem, pull out **Winternals' *ERD Commander 2003.*** Just boot the system from the ERD Commander CD. The interface couldn't be simpler—it looks and operates just like Windows XP. Click Start > Administrative Tools > Locksmith. Select the account whose password you'd like to reset from the drop-down list, and specify a new password in the following screen. Then reboot and enter using your newly created password. Note that you *must* select a new password, so if you think you can use *ERD Commander* to "hack" into an account without raising any red flags, think again.

Another great feature of ***ERD Commander*** allows you to revert to earlier System Restore points from within the application—a lifesaver when you can't boot into Windows XP, even in Safe Mode. ■



No password? No problem—if your trauma kit has *ERD Commander.*

Copyrighted material

World's smallest/lightest high-resolution camcorder and camera **combination!**

FISHER MULTIMEDIA

©2004. Fisher Multimedia. All rights reserved. LCD screen image is simulated. As of October 1, 2003 the Fisher FVD-C1 CameraCorder™ is the world's smallest/lightest high-resolution MPEG-4 video camera and 3.2 megapixel digital still camera combined in one unit for consumer use.

One Camera, Twice The Enjoyment...

Plus, it's easy editing with the Fisher High-Resolution Digital Pocket CameraCorder™

Take DVD-like quality digital video. Take 3.2 mega-pixel digital still pictures. Or take both at once! The Fisher CameraCorder™ is an all-in-one marvel (just 5.4 ounces) that has its own high-performance movie making and still picture software. Use the memory card in your PC or Mac or through the camera/docking station to connect to the USB port for fast downloading. Edit video or still material for transfer to DVD, video CD disc or email attachment.

New MPEG-4 technology optimizes the storage capacity for DVD-like quality video (30 frames/sec.). The Fisher CameraCorder™, which includes a 512-megabyte card, can store 1/2 hour of DVD-like video or over 3,900 photos.

Take it anywhere and be ready for any video/photo opportunity.

The Revolutionary Fisher CameraCorder™ is engineered by SANYO, one of the world's foremost digital imaging R & D sources.

www.fisherav.com

amazon.com and you're done. The Apple Store ULTIMATE ELECTRONICS

SANYO

Copyrighted material

VENGEANCE REIGNS FROM ABOVE.

TRIBES VENGEANCE

Destruction. Chaos. Retribution.

Tribes® is back with a vengeance. The ultimate high-flying, multiplayer FPS battle experience returns with deadly new weapons, faster and more versatile flight, in-depth strategic team action, and the first-ever Tribes single-player campaign.

Soar into battle with jetpack-enhanced multiplayer combat

Blast the opposition with all-new weapons and vehicles

TEEN
T
Blood
Mild Language
Violence
ESRB CONTENT RATING www.esrb.org

PC CD-ROM SOFTWARE

Irrational Games

ATi

POWERED BY gamespy

VIVENDI UNIVERSAL games

SIERRA™

www.tribesvengeance.com Coming October 2004

© 2004 Sierra Entertainment, Inc. All rights reserved. Sierra, the Sierra logo, Tribes and the Tribes logo are trademarks or registered trademarks of Sierra Entertainment, Inc., in the U.S. and/or other countries. Vivendi Universal Games and the Vivendi Universal Games logo are trademarks of Vivendi Universal Games, Inc. Developed exclusively by Irrational Games. Irrational Games is a trademark of Irrational Studios, LLC. ATI is used under license and is a registered trademark or trademark of ATI Technologies Inc. in the United States and other countries. GameSpy and the "Powered by GameSpy" design are trademarks of GameSpy Industries, Inc. All rights reserved. All other trademarks are property of their respective owners.

Copyrighted material

MAXIMUM PC EXPLAINS THE

BIRTH OF A CPU

HOW PC PROCESSORS ARE CONCEIVED, DESIGNED AND MADE

BY BILL O'BRIEN

When the IBM PC shouldered its way into the computer marketplace in 1981, it proudly boasted a state-of-the-art Intel 8088 central processing unit under the hood. The 8088 chugged along at 4.77MHz, had no internal math coprocessor (called the 8087, this external option cost an extra $500), used a 16-bit internal data bus, an 8-bit external data bus to maintain compatibility with existing computer components, and contained a record-breaking 29,000 transistors.

In case you weren't paying attention, the internal transistor count of today's CPUs has increased by a factor of 6,000 since then. Amazingly, the physical size of the CPU core hasn't gotten any bigger (it remains roughly the size of a thumbnail).

The creation of a CPU with 178 million transistors is, not surprisingly, a vastly complex process that involves chemical broths, ultraviolet light, and the delicate act of slicing silicon cylinders in order to etch designs that are invisible to the naked eye. And—realize we say this with a large dose of irony—the process also relies heavily on the assistance of other computers.

While processor manufacturers all have their own proprietary parlor tricks, CPU design involves the same fundamental processes, and that's what we're going to show you today—six essential steps in contemporary processor design and manufacture. So slip into your bunny suit and enjoy the show!

Copyrighted material

Step 1: Polling for Processors

If you've always imagined that CPU design begins when a bespectacled geekazoid puts down his #2 pencil, raises his hand, and says, "Um, I just got this great idea for a new CPU...," you're way off base. The fact is that no single person is responsible for drumming up a new CPU feature set.

In reality, even though you're probably not aware of it, *you* design next-generation processors. At least by proxy. That's because CPU design ultimately begins with an assessment of what the market wants and needs. It's what Intel calls a "usage model." A usage model defines the tasks people would probably use the new CPU for, with the underlying logic that if a new processor succeeds in accelerating these tasks, the public will naturally want to get one in their hands as soon as possible.

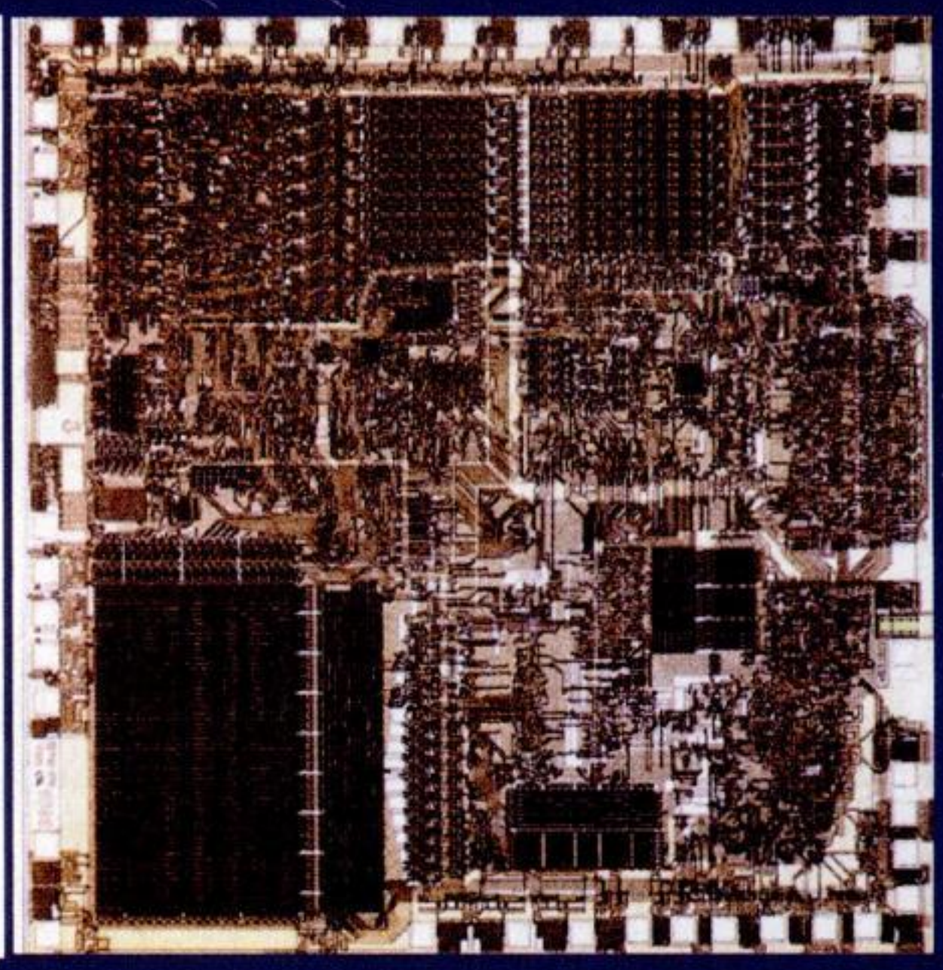
But CPU manufacturers like Intel and AMD don't just stop people on the street and ask them what they need more processing power for. They also consult with a host of partners—including motherboard and component makers as well as software developers. For example, they want to know if motherboards with audio and/or video are in demand and what type of graphics cards—mid-level, high-end gaming, or video—are hot before they settle on a usage model definition. In effect, they're creating a topological sales map of the marketplace. As you might expect, there's a bit of back-and-forth here; because the CPU makers have a vested interest in driving demand for new CPUs, companies like Intel and AMD also encourage the development of new applications for the PC, especially CPU-intensive programs that will allow new chip designs to shine.

As an example, Intel has developed a desktop usage model called the "digital home." In terms of home usage, the giant chipmaker determined, the PC is used as a television, DVD player, sound system, and gaming system. It's also used to capture and manipulate graphics as well as video and audio files.

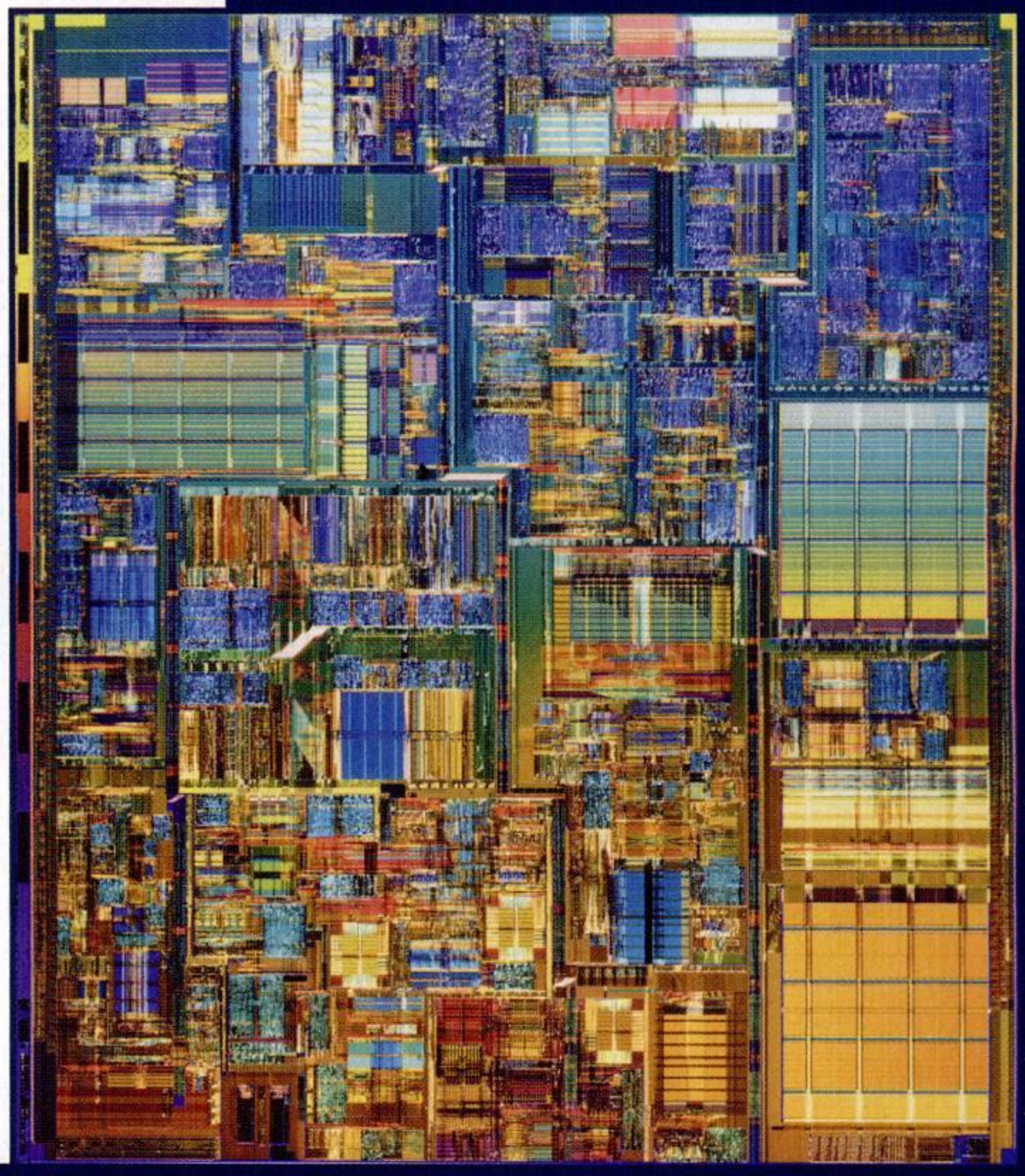
Step 2: A New CPU is Conceived

The set of electronics that play an intermediate role between the processor and the rest of the computer must be considered before the conceptualization of a new CPU can move ahead.

With this in mind, the chipmaker matches a set of design and performance goals to the current capabilities of existing chipsets in order to ascertain what new CPU functionality the chipset can handle via a firmware or BIOS update. ➔



The 8086 was intended to be the first processor for mass production in personal computers, but ultimately that honor went to the 8088 (pictured above). Released in 1979, the follow-up to the 8086 proved much less expensive to implement in boards and systems.



Colorizing this image of a Pentium 4 processor allows the organization of various components within the chip to be seen... without the aid of super-strength opera glasses. Compare this with the 8088 above, and it's instantly obvious how much more complex today's CPU tech is than yesteryear's.

Copyrighted material

It may look like a space-age serving tray (think diplomatic meals on the Enterprise), but it's actually hundreds of CPUs etched into a giant silicon disc. Each CPU will soon be cut away with lasers, and then individually tested for speed and reliability.

Multimedia extensions (MMX), single-instruction multiple data (SIMD) handling routines, and Hyper-Threading were all specialized new CPU instruction sets that were slipstreamed or "turned on" in existing chipsets after the release of a new CPU.

Typically, chipset design teams—who work closely with the CPU design teams—know well in advance what new CPU features are on the drawing board, and are able to build chipsets that will accommodate new instruction sets and features. In some circumstances, however, a brand-new chipset has to be created.

A short but powerful example of these first two steps is this: Legions of fanatic high-end PC gamers provided CPU manufacturers with not only a very specific usage model, but also a hungry consumer base willing to pay more for extra performance. As a result, Intel released the Pentium 4 Extreme Edition with its huge 2MB Level 3 cache and the performance-oriented 875P chipset.

Step 3: Virtually Prototype the CPU Supermodel

Once all the data has been gathered and the usage model created, the initial designs are produced in the form of two computer models—logical and physical.

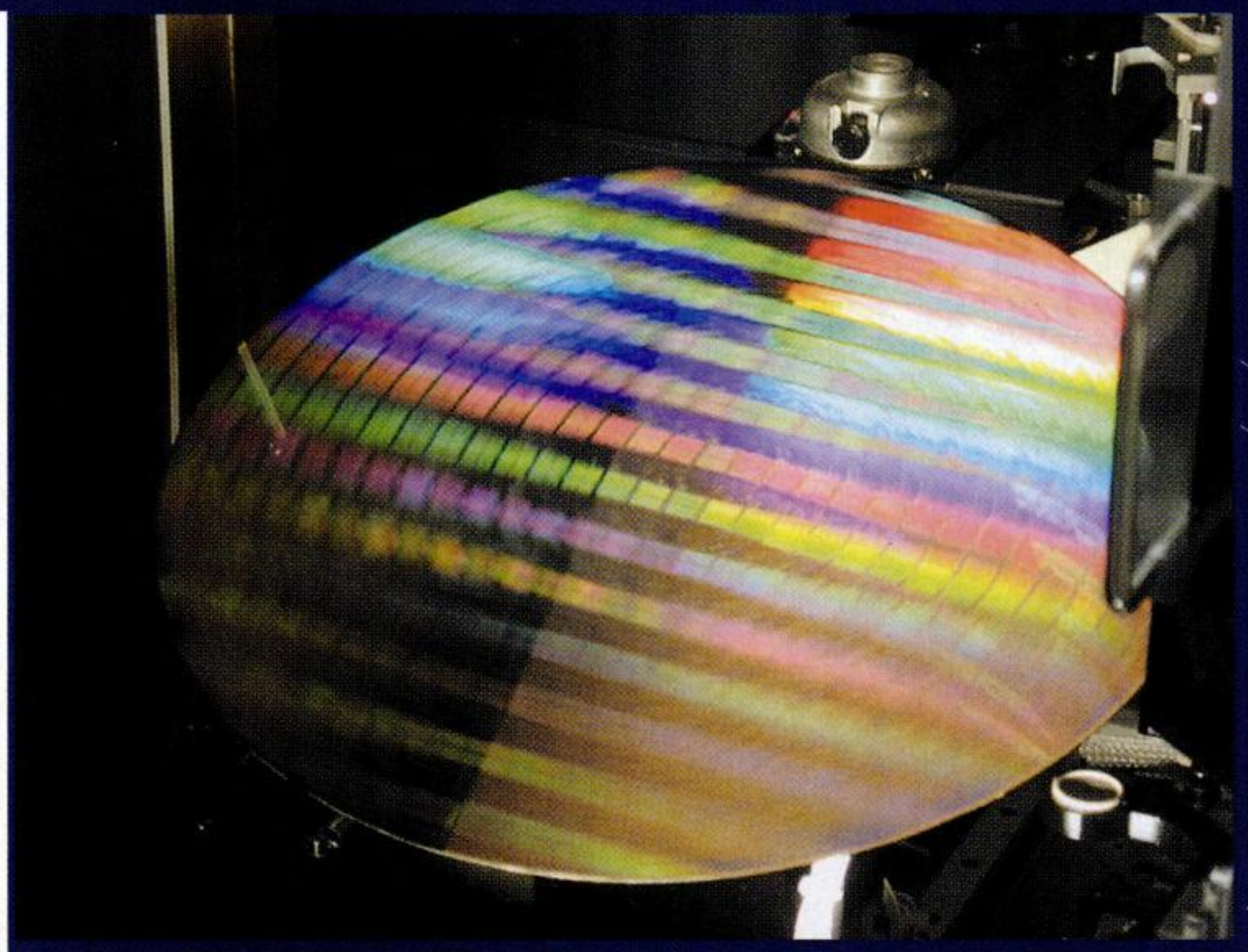
The logical model is a kind of block diagram that describes how the various parts of the CPU should work together and where they should be placed. In other words, how can the 175 million transistors be arranged →

Copyrighted material

in a space not much bigger than a thumbnail? A special "logic team" is assigned to develop this schematic while ensuring that the resulting CPU design performs all the functions it's supposed to, or at least comes as close as possible with a minimum of compromises. The logic team takes the block diagrams of logic—literally, the pathways along which electricity and data will move—necessary for the CPU to do its thing and assembles it, indicating that a bus should go here, an arithmetic logic unit (ALU) ought to go there, the memory should be over here, etc. The block diagram is essentially just an organizational chart that shows the circulatory system of the proposed CPU.

While part of the logic team is putting together these CPU building-block schematics, another part of the team is charged with validating these prototype arrangements.

They do this by using the mother of all simulation apps—a register transfer language (or RTL) simulator. The RTL simulator is to aspiring CPUs what a flight simulator is to aspiring pilots. It duplicates everything that can and should happen in a CPU's operations, including crashes, without the heartbreak and expense that can come from testing completed hardware. By feeding the prototype processor design along with some test code into the RTL simulator, the logic team assures that nothing in the initial design conflicts with another operation and that everything actually works the way it was meant to work.



After they are cut from the cylinder, silicon discs are spun at high rotations to confirm surface uniformity. The irresistible urge to "scratch" the disc like a DJ at this stage is one reason why tours are generally not conducted in processor factories.

Step 4: Implement and Validate the CPU Supermodel

Logic tools like the RTL simulator are of such high quality and reliability these days that mistakes are quite rare, but even so, the simulations don't stop here. Now it's the physical model team's turn. Their job is to determine whether all of this virtually prototyped logic, which is still basically conceptual, will work once it leaves the design phase and becomes actual hardware.

To accomplish this phase of development, the team begins implementation of the circuits—say, a memory area that will store custom cache or some control logic that tells the CPU how it should perform a specific function. The implementation is then run through a synthesizer that maps the circuitry onto a virtual silicon layout. In this format, the CPU design looks, smells, and tastes just as it will when it's actually created—except that there is no look, smell, or taste because it's all still virtual.

A successful implementation still isn't enough at this stage. The physical team must also prove that the circuit will run reliably at the specified clock speed when it's actually built. Not all designs do—sometimes they need to be nudged a bit. That's not surprising when you consider the miniscule size at which everything is supposed to work.

After this process is completed, any changes suggested by the physical team—for example, say, a logic design works but can't be physically implemented because of crosstalk between circuits—go back to the logic team for reworking. When that's done, the physical team works its magic again and the situation is repeated until everything jibes. This neat little quality-control loop is often referred to as an "iteration." For instance, "we needed to iterate that circuit several times," rather than, "we really messed that one up. Let's try it again."

At the end of this logical/physical tug of war, the design is closed and re-submitted to the RTL simulator once more, just to be sure. If it passes, the computer model is finally ready to go to silicon.

Step 5: The Die is Cast

Getting the CPU model to "hard copy," as it were, is not much easier than developing the model in the first place. This process involves photoetching the components—both the transistors *and* their connections—onto silicon. The layouts developed in the simulations need to be transferred to photo masks (similar to photo negatives), which sounds simple enough, until you realize that each transistor may require several masks. There's a mask layer for every layer of metal and another mask that's used to define the connections between the components. And we're not talking *Photoshop* here. The masks are "drawn" onto the silicon itself using an electron beam. (As an example of →

Copyrighted material

EXILIM

exilim.casio.com

A New Style Of Camera.

A Camera With Style...EXILIM

Large 2" LCD screen
2.5 Times Super long-life battery

EX-Z40

POWERFUL SUPER LIFE BATTERY

3X OPTICAL ZOOM
4.0 MEGAPIXELS

So slim. So sleek. So stylish. So what are you waiting for? EXILIM, created by CASIO. Where innovation is the inspiration behind everything we do. CASIO was one of the first manufacturers to create a consumer digital camera with an LCD screen. We are experts in all things compact and captivating. And the result is EXILIM. A camera you can take with you anywhere. Shooting and sharing pictures has never been easier. It's the all-around coolest camera there is. It's EXILIM. It's CASIO. It's the camera for you.

EX-S3
3.2 MEGAPIXELS

EX-Z30
3.2 MEGAPIXELS

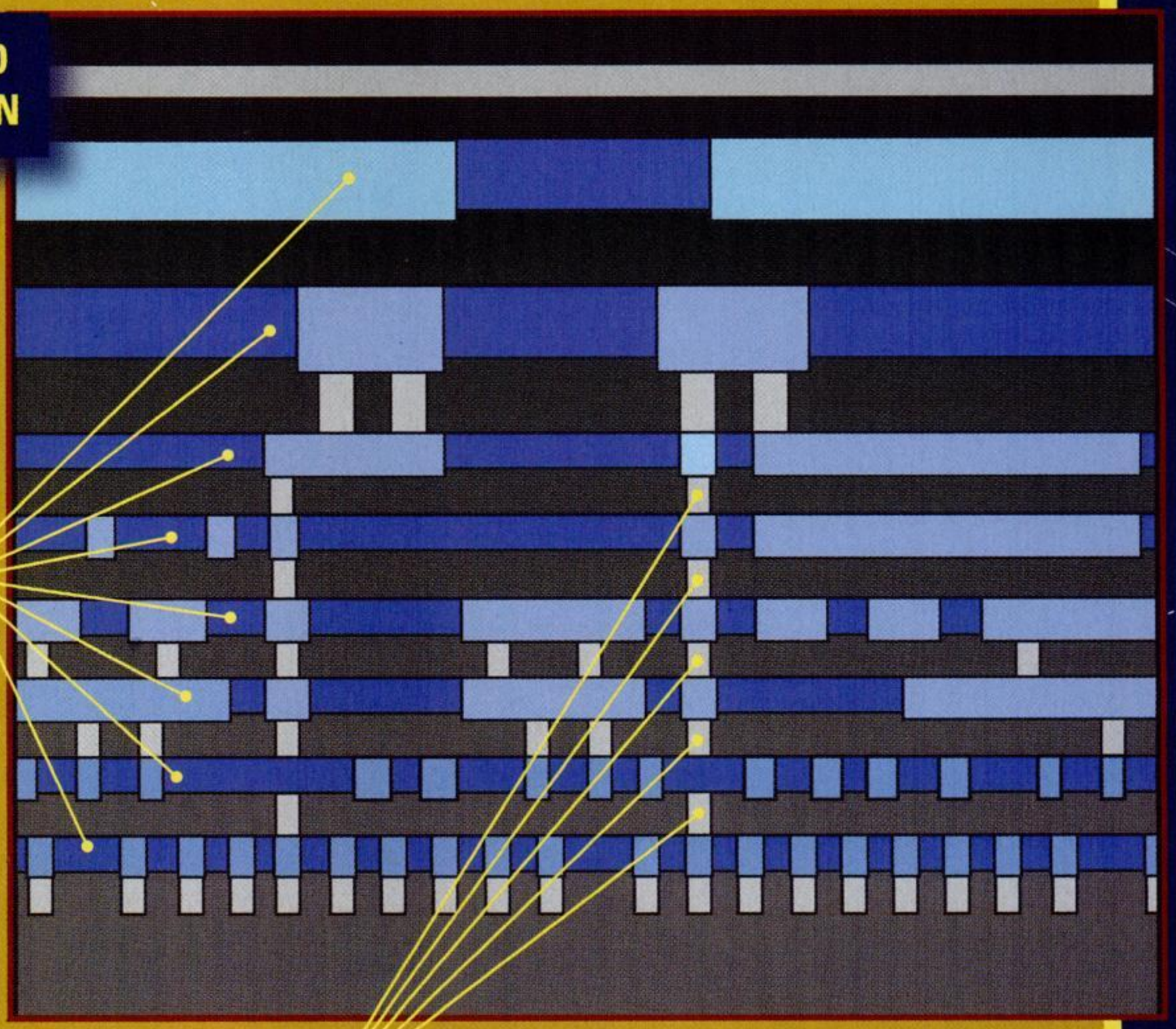
EX-P600
6.0 MEGAPIXELS

*2.5 times the battery life of current CASIO cameras (comparison between EX-Z4U and EX-Z40)
*CIPA standard for battery life indicates 360 photos on a single charge. Image on camera LCD simulated

CASIO®

Copyrighted material

CHIP LAYERS AND WHAT THEY MEAN



Today's cutting-edge processors fit millions of transistors into a single CPU with only eight or nine layers. This illustration, adapted from an actual electron microscope photograph of a CPU cross-section, shows how these layers interact.

Each layer (1) is called an interconnect layer, wired to transport data from one part of the chip to another (these layers get thicker near the top of the chip). The small posts you see between the layers (2) are called vias, which carry data up and down through the interconnect layers. The light blue squares denote operational areas of the CPU; the dark blue areas are transfer lanes for the data.

illustration by Brandon Voss

the microscopic scale we're talking about here, you could fit hundreds of circuit lines side by side on a single strand of a spider's web.)

Oh, and have we mentioned that silicon itself isn't a naturally occurring material? It's actually a component of beach sand that is scooped up (and divested of cigarette butts and seaweed) and refined. Why go through all the hassle? Because silicon is a tremendous semiconductor—it can alternately allow electricity to travel *through* it or be made to *block* electrical signals.

Here's the way the entire fabrication process works:

➤ Silicon is extracted, purified, liquefied, and then grown into long cylinders that are roughly 300mm (about 12 inches) in diameter. A thin wafer is cut off this silicon ingot (think salami log) and then heavily polished, after which it heads for a furnace where it's subjected to high temperatures that will create a layer of silicon dioxide on its surface.

➤ Next, a material called "photoresist" is layered onto the wafer, and one of the photo masks—which contains all the necessary CPU circuitry for that layer—is placed over it. The wafer is then exposed to ultraviolet light, which alters the chemical properties of the photoresist in the uncovered areas of the mask. The exposed photoresist is removed and the silicon dioxide under it is etched off.

➤ Then polysilicon (a conductor) is deposited on the wafer and new mask layers are made. As more and more layers are added, the final three-dimensional CPU package begins to evolve and take shape. Along the way, the exposed areas of silicon are doped—a process somewhere between coated and saturated—with ions that provide positive and negative charges to help the transistors turn on and off. (That's the great thing about binary circuits. No matter how complex the overall design, their components only need to be in one of these two states—"off" or "on"—at any time.)

➤ Small windows, the result of etching from what's called "reveal masks," are formed through the layers during each step of the process so they can be interconnected as needed to become complete circuits. Copper is used to fill in the windows and actually make the connections. On CPUs that pre-date the current 0.13 micron process, the filler of choice was aluminum. Copper has better thermal conductivity, though—it's about 60 percent more potent than aluminum, which not only saves energy but also speeds up heat dissipation.

In order to withstand the rigors of the photo-etching process, a wafer is initially cut thicker than it will need to be when it becomes the final CPU. Once the process is completed, about →

Copyrighted material

NSIST ON NVIDIA®

BETTER VIDEOS

BETTER GAMES

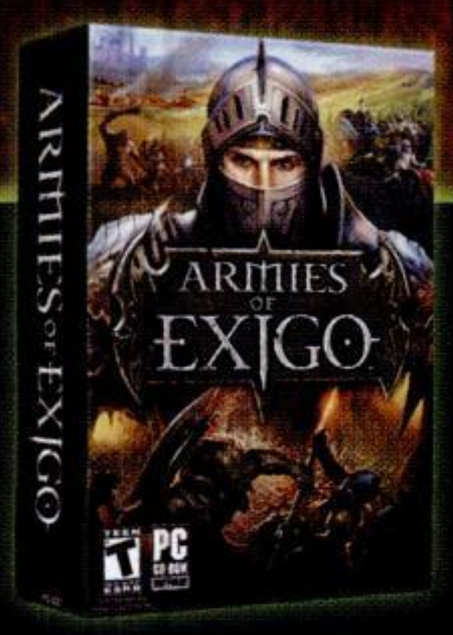
BETTER PERFORMANCE

© 2004 NVIDIA Corporation. NVIDIA, the NVIDIA logo, and The way it's meant to be played logo are registered trademarks or trademarks of NVIDIA Corporation in the United States and/or other countries. All rights reserved. Electronic Arts TM and Armies of Exigo TM are trademarks or registered trademarks of Electronic Arts Inc. in the US and/or other countries. All rights reserved. Developed by Black Hole Entertainment. Copyright 2004 Cinergi Interactive LLC. All rights reserved.

TEEN T Blood Violence CONTENT RATED BY ESRB

BLACK HOLE ENTERTAINMENT

BEFORE MANKIND PLUNGES INTO A WORLD OF DARKNESS, OBTAIN A WILL AND THE POWER OF NVIDIA.



WHEN A DARK EVIL ARISES FROM THE UNDERWORLD,
MAKE SURE YOU HAVE A COAT OF ARMOR AND A PC EQUIPPED
WITH AN NVIDIA GEFORCE GRAPHICS PROCESSOR FOR
BLAZING PERFORMANCE AND ROCK-SOLID RELIABILITY,
IN ADDITION TO STUNNING PHOTOS AND VIDEOS.

The way it's meant to be played NVIDIA.

www.aox.ea.com

www.nvidia.com

COMPUSA ARMIES OF EXIGO AND PNY'S GEFORCE 6800 AND 6800 GT GRAPHICS CARDS ARE AVAILABLE AT COMPUSA.

Copyrighted material

a third of its thickness is cut off the back side. This back side is then prepared so it can be mated to an outer case (the physical part we see). It's here that the electrical contact is made from the back of the circuit to the external pins.

Step 6: Weed out Bad CPUs

The result of all this work isn't a single CPU. The wafers are handled in batches of about 25 at a time and each of these pizza-size wafers holds a little more than 500 CPUs (called "dies" at this stage), at the current size of the Pentium 4. While still on the wafers, the dies are tested to shake out the good from the bad. No matter how stringent the pre-testing might have been, most normal manufacturing processes allow for about a 10 percent failure rate. And while no one will talk directly about the so-called "drop-out" rate for CPUs built on the micron scale (as a reference, a period is about 615 microns wide), you can expect it to be at least as high. Keep in mind, however, that "failure" doesn't necessarily mean the CPU won't run at all, just that it won't run at its expected speed. Some of these dropouts eventually become lower-speed versions of the processor. Convenient, huh?

At this point, the working dies are sliced by lasers from the wafers, flipped into their ceramic packages, connected to the pins that will connect the CPU to the motherboard, and equipped with a heat spreader.

Voila! A CPU is born.

Each wafer is individually examined by a real, live person (in the requisite bunny suit) for surface defects. Each individual processor on each wafer (of which there are hundreds) will later be tested for reliability.

You Think 90nm Is Small?

By 2011, CPUs will be constructed on a 22nm process. But a smaller process means bigger headaches for CPU makers

Today's cutting-edge processors use 90nm technology, but the plan is to get down to 65nm in 2005, and then shrink further to 45nm in 2007, 32nm in 2009, and 22nm by 2011. That's about a 75 percent reduction in size over just a seven year period!

A nanometer is one *billionth* of a meter, which itself is about 3.3 feet. The reason CPU manufacturers want to shrink the size of the die is because it's an easy way to increase operational speed without increasing the clock speed of the CPU. This avoids heat issues and a host of other concerns. Think of it this way: If you had to travel 90 miles and could go 40mph, it would take you 2.25 hours to make the trip. Now shorten that distance to 45 miles. Suddenly you only need 1.3 hours to reach your destination.

If it just dawned on you that making the die smaller while stuffing more things onto it should present some significant engineering challenges, you're right. If the size of the die shrinks, the size of the etchings on the die needs to be reduced as well. This creates some fundamental problems with the photo-etching process used to manufacture CPUs. When you take a picture, light is used to etch the image into the negative—or mask, in the case of the CPU. As any physicist will tell you, light has dimension—width. This width typically defines the smallest thing you can etch. Using conventional UV light, together with careful planning and corrections for optical distortions in the lenses, it's possible to print some features that are slightly smaller than the wavelength of the UV light itself. But this is not sustainable for long periods of time, and certainly not down to 22nm.

There is, however, a consortium working on the use of Extreme Ultraviolet light—the higher frequency, shorter wavelength side of the UV band of the spectrum, just below X-rays. Although there are always some tweaks and tricks, most current CPUs are made with 193nm "deep" UV light that's further narrowed by the use of special lenses. Extreme UV light is so far off on the edge of the spectrum that it produces 13nm light. The downside is that Extreme UV can't be used with conventional lenses. It requires reflective optics—mirrors essentially—and that means a revamp of equipment, which means more money. Once this is accomplished, however, the new process will likely allow chipmakers like Intel and AMD to continue on down perhaps even to the 5nm level (via tweaks and tricks again), which should bring us pretty close to 2017.

And after that? Anyone up for quantum computing?

Copyrighted material

The Future of PC Processors is Interesting—and Frightening

Maximum PC "Fast Forward" columnist Tom Halfhill ponders the future of CPUs. His prediction: CPU power will increase—but privacy may be sacrificed

It's easy to predict what microprocessors will be like in 2006, 2010, and 2015: They'll be small, black square things, just as they are today. OK, that's a bad joke, but it's probably the most accurate prediction you'll ever get. Even Intel avoids making forecasts beyond six years.

But at least we can narrow the possibilities. Don't expect a fundamental shift from conventional semiconductor technology before 2015. We can rule out pure optical circuits, quantum logic, carbon nanotubes, and other exotic technologies in mainstream PC processors. In 2015, I believe we'll still be using 20th century semiconductor technology, albeit with 21st century refinements.

In the near term, we know multicore PC processors are coming from both AMD and Intel, as I predicted way back in 1999. It's safe to say that dual-core PC processors will lead to quad-core PC processors and beyond, because chips with four or more processors are already fairly common in the server and high-performance embedded markets. By 2010, I'm betting it will be common for mainstream PC processors to have at least four cores. They will also be able to concurrently run multiple operating systems as independent virtual machines.

The speed gap between CPUs and memory will continue to widen, so we'll see larger caches and more caches on chip. By 2010, on-chip Level 3 (L3) caches will be commonplace and L4 caches will be popular. By 2015, we might see on-chip L4 caches and off-chip L5 caches.

Security is a huge trend. The recent addition of the no-execute (NX) bit to x86 processors is only the beginning. By 2010, all CPUs will have stronger mechanisms for insulating user programs and operating systems. These mechanisms will work at the chip level, making it far more difficult for the PCs of the world's largest companies to be subverted by moderately clever teenage hackers. Not coincidentally, the new security features will also thwart illegal exchanges of copyrighted digital content, such as music and videos.

Even spookier: By 2010 or 2015, I expect some "spyware" to be hidden in CPUs. Already today, some scanners, printers, and image editors can recognize if you're counterfeiting money, and many cars have data recorders like the black boxes in airliners. Similar capabilities in CPUs will assist law enforcement and help corporations administer their computer policies. This trend will spark an underground revival of old PCs that are considered "digitally clean"—it may be that the most popular processors of tomorrow might be the ones we have today. ■

CPU Predictions: In 2010...

1. Quad-core CPUs will be the norm
2. We'll have on-chip L4 caches and off-chip L5 caches
3. Rigorous built-in security will guard against hacking
4. DRM will be implemented at the processor level
5. Built-in black box functionality will aid law enforcement and eliminate some aspects of privacy

CPU's Greatest Hits

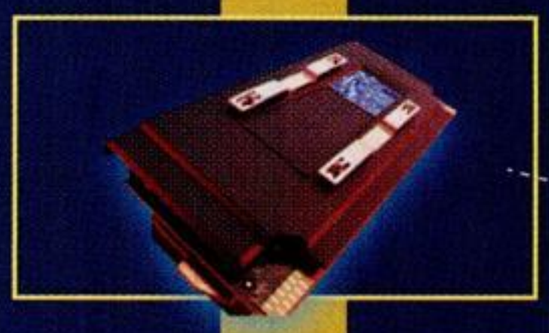
Processor milestones in the *Maximum PC* Hall of Fame

Pentium II Klamath

The first CPU to use a slot-type packaging, the Klamath was widely used in the 440LX chipset and had 512kB of L2 cache.

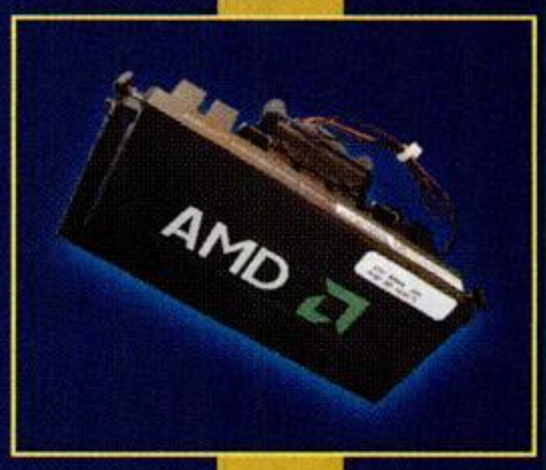
Celeron A

This low-cost screamer overclocked like a mofo, and was loved by cost-conscious enthusiasts everywhere. Its FSB ran at a decent 66MHz, and it was offered in speeds ranging from 300 to 533MHz.



Pentium III Coppermine

This audacious CPU broke the gigahertz barrier and also became the first Pentium CPU to include on-die L2 cache.



AMD Athlon Classic

As the first CPU to challenge Intel's supremacy in the "performance" category, the Athlon meant AMD meant business. It used a Slot A architecture and had impressive floating-point performance.

Athlon Palomino/XP

The chip of choice for gamers and penny pinchers, the Athlon XP had a spectacular price-to-performance ratio compared to Intel silicon. It marked AMD's move to copper interconnects and debuted at 1300MHz.

Duron Spitfire

Named after the World War II fighter plane, this .18 micron chip sported a measly 64k of L2 cache, but was still able to outpace Intel's "Coppermine" Celeron. It debuted at 600 and ran all the way up to 950MHz.

Copyrighted material

Systemax™

The Great American Computer Maker

Do You Have What It Takes?

Monitor not included.

Systemax recommends Microsoft® Windows® XP Professional

Take your gaming to new heights thanks to the Intel® Pentium® 4 Processor with HT Technology Extreme Edition.

The latest processor from Intel, the Intel® Pentium® 4 Processor with HT Technology Extreme Edition, enables sophisticated physics engines and artificial intelligence to put you in the driver's seat. Get the Systemax Venture HU-X to enjoy a real-world gaming experience.

Choose From Three Great Chieftec Liquid Gloss Cases!

Liquid Gloss Silver

Liquid Gloss Blue

Liquid Gloss Black

Systemax Venture HU-X

- Intel® Pentium® 4 Processor 3.4GHz with HT Technology Extreme Edition
- Microsoft® Windows® XP Professional
- 1GB DDR PC3200 Memory
- DVD±R/RW Drive
- Dual 74GB SATA 10,000 RPM HD
- ATI Radeon 9550 256MB Video Card with TV and DVI
- 865PE Neo2 - PFISR Motherboard
- Chieftec Liquid Gloss ATX Case with 2 Blue Neon Lights, Blue Intake Fan and 2 Tri-Colored LED Fans
- 500 Watt Power Supply with Blue LED Fan
- Logitech Internet Keyboard and Optical Mouse
- Premium One Year Parts & Labor On-Site Warranty
- Toll-Free Tech Support, ANYTIME!

$2499.99

SYXS-DG-036151

American Power And Freedom. By Systemax.

We're a 50-year-old company, serving the needs of our customers since 1954—and a proud Fortune 1000 corporation. We stand behind every computer we sell, with our "Tech In a Box" package of expert advice. No other PC manufacturer goes the extra mile to ensure your 100% satisfaction. And every Systemax PC is assembled, serviced and supported by our own world-class team—right here in America. You can expect the best value—and the best service.

Available At: TigerDirect.com

SHOP ONLINE AT: www.tigerdirect.com OR CALL 1-800-844-3797

Please Mention Code: **MAXPC1104**

intel inside pentium® 4 EXTREME EDITION HT

The Intel, Intel Inside, Intel Inside logo, Intel Centrino, the Intel Centrino logo, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Wireless connectivity and some features may require you to purchase additional software, services or external hardware. Availability of public wireless LAN access points limited. System performance, battery life, wireless performance and functionality will very depending on your specific hardware and software configurations.

Copyrighted material

How To... A step-by-step guide to tweaking your PC experience

GET THE MOST FROM Matrix RAID

Intel's new RAID controller lets you run two different arrays using just two drives

MAXIMUM PC
TIME TO COMPLETION
00:45
HOURS MINUTES

BY JOSH NOREM

An all-new storage technology called Matrix RAID has emerged from Intel's skunkworks, and it offers a feature we've wanted for a long time—the ability to create RAID 0 and RAID 1 volumes on a single RAID array using just two hard drives. Matrix RAID is available on Intel's new 915 and 925 chipsets, which include the ICH6R south bridge. Imagine: You can take one pair of drives (also known as an array), and create a redundant mirrored volume for your OS and important documents, and a high-performance striped volume for apps, games, and any other applications where speed is more important than data security.

Although the technology is straightforward, the documentation that came with our ICH6R motherboard forced us to figure things out for ourselves. We'll walk you through configuring a basic Matrix RAID array, so that you won't have to muddle around like we did. We used a pair of Western Digital 74GB Raptors for our example, but Matrix RAID works with any pair of identical Serial ATA hard drives. Just adjust the size of your volumes to suit your needs.

Words to RAID by

RAID: *Redundant array of inexpensive disks*—a system that allows you to combine multiple drives in a single partition for either data redundancy, added performance, or a combination of the two.

ARRAY: An array is a group of hard drives. For RAID, a minimum of two hard drives is required for it to be considered an "array."

VOLUME: A disk volume is any portion of a drive or array that has its own drive letter.

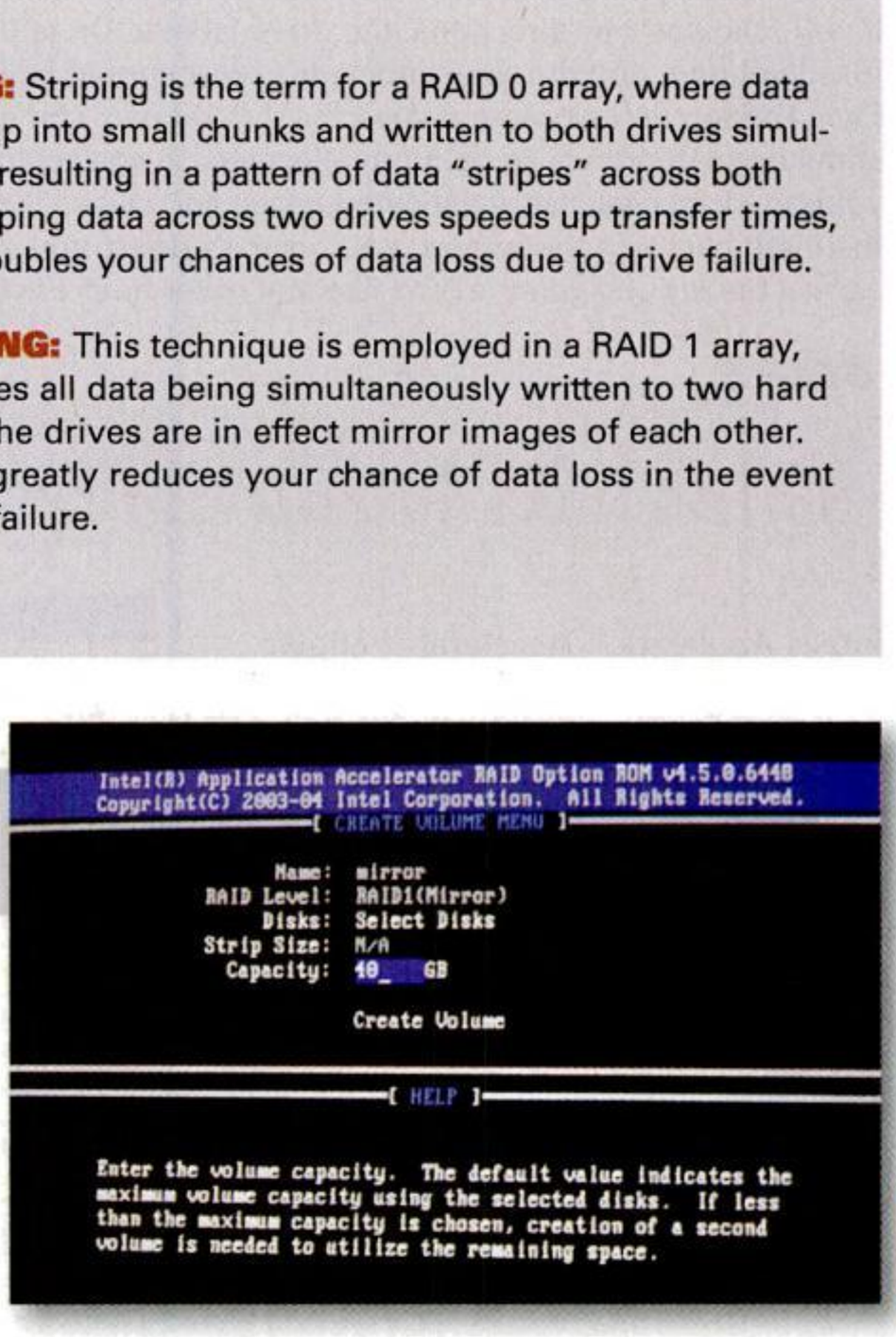
STRIPING: Striping is the term for a RAID 0 array, where data is broken up into small chunks and written to both drives simultaneously, resulting in a pattern of data "stripes" across both drives. Striping data across two drives speeds up transfer times, but also doubles your chances of data loss due to drive failure.

MIRRORING: This technique is employed in a RAID 1 array, and involves all data being simultaneously written to two hard drives so the drives are in effect mirror images of each other. Mirroring greatly reduces your chance of data loss in the event of a drive failure.

STEP 1

Build a volume for reliability

The first thing we need to do is create a mirrored partition to hold Windows XP. Once the PC boots, press Ctrl+i to access the RAID configuration utility. Select RAID 1 and choose the drives to be used. You could choose RAID 0 at this point since you will also be creating a volume for that, but whichever array you configure first will be your primary drive. We allocated 40GB of space for our OS and apps—remember, this will consume 40GB of *each* drive. That means there is roughly 60GB left over in our test array, which we'll use for our striped volume.



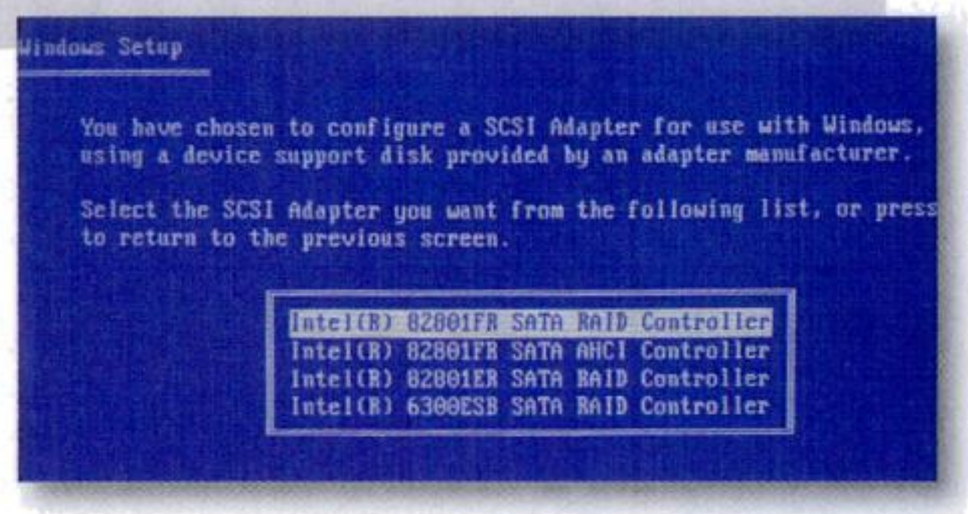
STEP 2

Build a volume for raw speed

Now that your mirrored volume is created, it's time to create a speedy striped volume. Select "Create RAID volume," and choose "RAID 0." You'll need to choose a stripe size—we generally recommend either 64KB or 128KB for optimal day-to-day use. Then simply select "Create Volume."

STEP 3

Install Windows

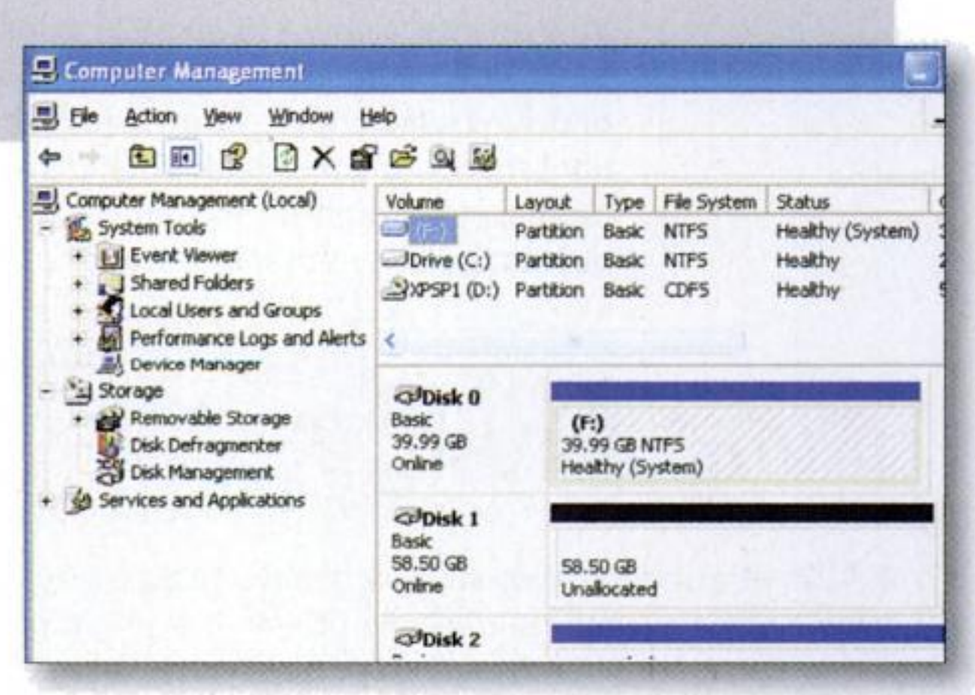


Installing Windows on a Matrix RAIDed volume is the same as installing an OS on any other RAID array. Boot off the Windows CD, then Press F6 when Windows prompts you to "Install a third party SCSI or RAID driver" and insert the floppy disc that came with your mobo when prompted.

When Windows asks which partition to install Windows to, make sure you choose the mirrored partition that you created first. Frequently the only way to tell partitions apart is by noting their size (remember, our mirrored partition was 80GB total). After you choose the proper partition, the Windows install should proceed as normal.

STEP 4

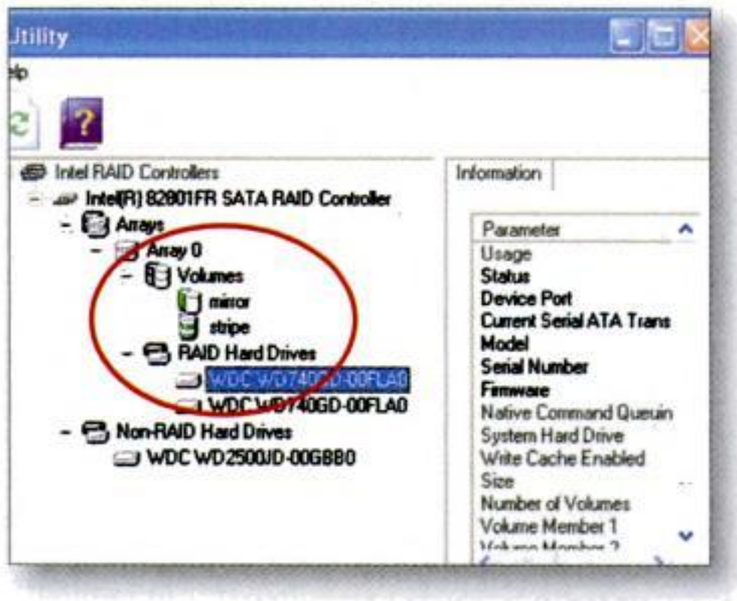
Managing the volumes



Once Windows is installed, you'll need to format your striped partition so you can begin using it. Open the Computer Management applet (Control Panel > Administrative Tools > Computer Management) and click Disk Management. You should see separate drives for each of the volumes in your RAID array. If you followed our directions, the drive labeled Drive 0 should be your mirrored volume, and the drive labeled Drive 1 should be your striped volume. Even though you already created the striped partition earlier, the space will show up in Windows as being unallocated. To correct this and activate the volume, right-click the unallocated space and select "Create Partition." Follow the instructions in the wizard, and once it's done, you should be able to access the striped volume, just like any other hard drive.

STEP 5

Install Intel's RAID utility



Intel's Application Accelerator allows you to keep tabs on your array. As you can see in this screenshot, both the striped and mirrored arrays are fully functional. This utility allows you to monitor your arrays' status, and will warn you if it detects an impending failure or actual failure with one of the disks in the array.

Installing the RAID utility is optional, but we recommend it. Remember that although the data on your mirrored volume is safe if one of your hard drives fails, all of the data on the striped volume is toast if one drive fails. If while running the striped array the Intel RAID utility ever warns you your drives are going to fail, back up the data on the striped volume *immediately*! ■

WHAT ABOUT PERFORMANCE?

In order to determine whether running two distinct arrays across two drives diminishes either array's performance, we benchmarked each array using *HD Tach 2.61*. We're happy to report that performance for both arrays was comparable to what we've seen with single-array RAID configurations.

HD TACH 2.61	RAID 0	RAID 1
AV. SEQ. READ SPEED (MB/SEC)	109	65.35
BURST RATE (MB/SEC)	197	112
RANDOM ACCESS TIME (MS)	7.7	6.7

Notes: Results are for a two-drive array consisting of WD 740GD Raptors.

Copyrighted material

WELCOME TO AN ENDLESS NIGHTMARE OF

PAIN AND SUFFERING

WELCOME HOME

Home is definitely where the heart is.

Along with some spleen. And a little chunk of liver in the hall.

"Best Adventure Game of E3" - ***IGN.com***

"Forget about pushing the envelope. Silent Hill 4 tears it to pieces." - ***XBN Magazine***

"In the end, Konami's game will, without a doubt, be the preeminent scare fest of 2004." - ***IGN.com***

SILENT HILL 4 THE ROOM™

▪ New 1st Person Mode ▪ Riveting Story ▪ Ghostly New Creatures ▪ Grisly Environments ▪

MATURE 17+

M

Blood and Gore
Intense Violence
Sexual Themes

ESRB CONTENT RATING www.esrb.org

PlayStation.2

XBOX

PC CD ROM

The way it's meant to be played NVIDIA

KONAMI

www.konami.com/usa

KONAMI® is a registered trademark of KONAMI CORPORATION. © 2004 KONAMI. ALL RIGHTS RESERVED. SILENT HILL 4 THE ROOM™ is a trademark of Konami Computer Entertainment Tokyo, Inc © 1999 2004 Konami Computer Entertainment Tokyo. ALL RIGHTS RESERVED. Microsoft, Xbox, and the Xbox logos are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. "PlayStation" and the "PS" Family logo are registered trademarks of Sony Computer Entertainment Inc. The ratings icon is a trademark of the Entertainment Software Association.

Copyrighted material

Ask the Doctor

Symptom ▶ Diagnosis ▶ Cure

ALL-IN-WONDER OVERCLOCKING

I'd like to overclock my ATI All-in-Wonder 9600 card, but I wonder how that would affect the card's video capture and PVR functions. If the card seems stable with games, can I safely assume its other functions will be OK too?

—D. L.

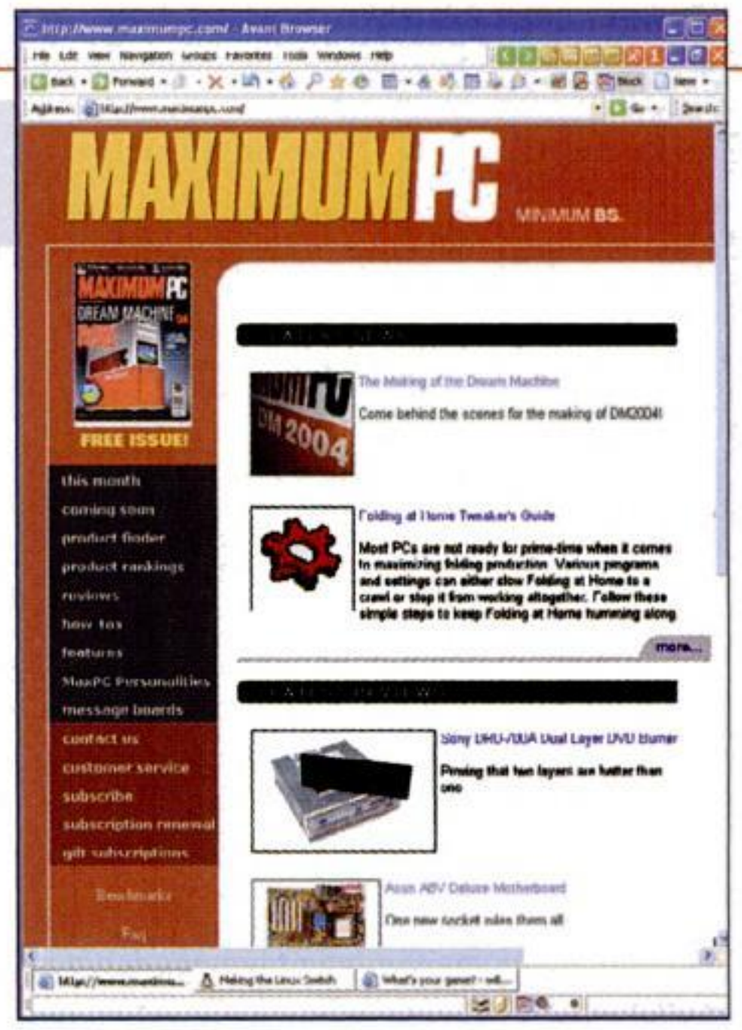
It's been a while since we've done any overclocking on ATI's All-in-Wonder cards, but we can't imagine it would cause problems with the vidcap features. Nevertheless, to be safe, you can do some testing of your own with the videocard overclocked. We recommend you record four to five hours of programming that you won't miss should it get messed up—the next *Real World/Road Rules* marathon on MTV will work. This should reveal any overheating problems that might occur as a result of overclocking.

ARE IE ALTERNATIVES MORE SECURE?

I recently read an article in *Maximum PC* about *Avant* and *MyIE2* browsers and was left with a question: Do the two browsers, both of which are built on *Internet Explorer*, share the same security risks and vulnerabilities of Microsoft's browser? Or are *Avant* and *MyIE2* more secure?

—PSICORPS

The reason we prefer Mozilla *Firefox* and *Opera* to the *Avant* and *MyIE2* browsers is precisely because of *Internet Explorer's* inherent insecurity, which unfortunately affects the browser's offshoots. (Tabbed browsing and nifty extensions are just icing on the *Firefox* and *Opera* cakes.) With *Firefox* or *Opera*, you don't have to worry that you might render your system useless by accidentally installing a malicious ActiveX while innocently browsing the net. *MyIE2* and *Avant* don't afford the same protection.



Unfortunately, because *MyIE2* and the *Avant* browser use *Internet Explorer's* rendering engine, they're prone to all the same insecurities and foibles that plague *IE*.

DVD FORMAT WARS

Hey, Doctor, which DVD rewriteable format is ideal for backing up movies? Is it DVD-R or DVD+R? Also, does the brand of the DVD media matter?

—S. FRONDARINA

The Doctor assumes you mean which DVD *recordable* format is ideal for backing up movies—DVD+R and DVD-R media can only be written to once. DVD+RW and DVD-RW are the rewriteable formats, but you don't want to archive your DVD-Video to either of these formats because the media is more expensive than write-once discs and their compatibility with set-top players is far lower.

Sadly, neither of the write-once formats will work for everyone. The first consideration is the kind of media your burner supports. If it's a single-format burner that supports just DVD+R or DVD-R, then that's what you're stuck with. Luckily, the set-top compatibility between these two formats is pretty comparable.

If you've got a dual-format burner that can write to either format, then consider what kind of media is supported by the set-top player you're going to play your discs on. Some players prefer DVD-R, others will read only DVD+R, and some read both. If the manufacturer doesn't specify one or the other, the only way to know is to create test discs with both formats and try them out on your DVD player.

Note that most commercial DVDs use dual-layer discs. The box almost always says whether the disc type is single- or dual-layer, but you can be certain it's dual-layer if Explorer reports the disc contents as exceeding 4.7GB. If it does, you'll need a dual-layer burner and dual-layer media to make a perfect copy of the disc (as of press time only DVD+R supports dual-layer; DVD-R dual-layer drives will be available soon). If you don't have a dual-layer burner, you'll have to compress the movie first, using an application like *DVD Shrink* (free, www.dvdshrink.org) in order to archive the contents onto a single-layer disc.

GAUGING PERFORMANCE INCREASES

Lately I've been spending a lot of time and money trying to increase my computer's performance. I've replaced my old 7,200rpm hard drive with two 120GB 7,200rpm Maxtors set up in a striped RAID array, replaced my aging graphics card with an ATI 9600XT, and installed two 512MB DDR sticks in dual-channel mode. Is there any way I can accurately gauge the performance difference that's resulted from these changes, or do I simply have to "feel" the difference?

—GEORGE DEVIS

It's actually quite easy to do some rudimentary benchmarks on a system. For instance, you can download the demo version of *3DMark 2003* at www.futuremark.com and run the default test, or use a game with a built-in benchmarking mode like *Doom 3* to gauge performance. (To run *Doom 3's* benchmark mode, open the game, open the console by pressing Ctrl+Alt+~ and type "timedemo demo1" without the quotes.) The thing is, in order to accurately determine a performance difference, you need to run the test/s before and after the hardware upgrades. If you're not inclined to return your PC back to its original, unupgraded state in order to run the "before" benchmarks, then, yes, this time you'll have to judge any performance increase by "feel."

KEEPING IT WIDESCREEN

I recently bought a Lite-On DVD burner and it came bundled with Sonic *MyDVD 4*. I'm trying to burn AVIs to a DVD so I can use them in my set-top player, but for some reason, *MyDVD 4* will change my widescreen format AVIs to fullscreen. I've tried different settings and configurations but haven't been able to come up with a solution. Can you recommend a solution or alternative program that will let me watch AVIs in their native widescreen format?

—BRIAN KNAPP

The first thing you should do is consider an upgrade to a newer version of *MyDVD*. We too experienced weird problems with *MyDVD 4*, but they vanished when we upgraded to *MyDVD 5*, which

Copyrighted material

features much better support for transcoding AVIs, especially compressed ones, into the DVD format. Sonic also just released *MyDVD 6*, but we haven't had a chance to test it yet.

Alternatively, you can experiment with freeware programs such as *VirtualDub* (www.virtualdub.com) and *TMPGEnc* (www.tmpgenc.net) to transcode files into a DVD-ready format *before* sending them to *MyDVD*. But be warned—these programs are tough to learn and master. You'll find www.doom9.org has tutorials that should get you started with these apps.

DO NOT ADJUST YOUR VERTICAL...

I'm writing to you about my NEC MultiSync FE991SB 19-inch CRT monitor, which I just purchased. Within the first 10 minutes of use, I noticed an odd-looking greenish hue in the upper left and lower left-hand corners of the monitor. Furthermore, there are two extremely fine lines running horizontally across my monitor. What could the problem be, and is there anything I can do to correct the problem? I would hate to have to ship the monitor back for a replacement.

—JON M. RYAN

Most likely, the discoloration you're noticing at the corners of your monitor is the result of magnetic interference – something CRTs are susceptible to. A buildup of magnetism either external or internal to the monitor can cause a CRT's electron beams to be deflected from hitting the appropriate phosphors, thereby causing discoloration, or sometimes a rainbow effect. Your first course of action is to run several degauss cycles on the monitor, waiting 20 minutes between each cycle. This option is usually available via the onboard controls. Also move any objects near the monitor that may include internal steel, iron, or magnetic material. Examples include speakers, small black power transformers, telephones, staplers, electric pencil sharpeners, etc. If the monitor rests on a steel desk or table, or if you have steel office furniture nearby, move the monitor to another location to see if that is a problem. Also try rotating the monitor by 180 degrees and degauss it as above. If the problem persists, try a manual degaussing coil, available on the Internet, which is capable of producing greater degrees of the alternating magnetism necessary to neutralize the offending magnetism.

The fine lines you're noticing across the width of the screen are characteristic of aperture-grille CRTs in particular. An aperture grille is a series of vertical wires running from top to bottom behind the screen, and through which the CRT's electron beam passes when creating the image you see onscreen. Any movement to these wires can cause the image to jiggle or become otherwise distorted. To keep the aperture grille taut and the image stable, very fine "dampening wires" span the grille horizontally at select points. Depending on the size of the monitor, there can be one, two, or three dampening wires present, and faintly visible.

MYSTERY MEM

I have a single 512MB stick of PC3200 DDR memory in my system. The module is covered by a nonremovable copper heatsink and there is no label to tell me who made it. Is there some sort of program I can use to get information about my mystery memory module?

—DAVID EDGAR

Most RAM tools let you read the SPD, or serial presence detect, chip on the module. The SPD usually contains RAM timings and other data that the motherboard's BIOS reads when it initializes the motherboard and sets the memory speed, and oftentimes the SPD will reveal the name of the manufacturer. Ultra-X's (www.uxd.com) hardware diagnostic tool RAM Stress Test Pro *2* provides extensive information about your RAM including the SPD data, but it costs $699. A cheaper method is to get the pro version of *SiSoft Sandra* (www.sisoftware.net), which will read the SPD data at the very least. Keep in mind that the memory maker's name will only be there if the company programmed it in. Many generic modules contain little more than the basic info necessary to get the board up and running.

I'VE GOT THE POWER!

I have a new Toshiba M200 Tablet PC, which I love, but I can't seem to find an external DVD-ROM drive that doesn't require an external power source. I've seen a Toshiba CD-RW/DVD combo drive that comes with a battery pack and allows for portable play, but it only lasts about two hours. I really want an external drive that requires only the power from a USB 2.0 port. I don't care if it can record DVDs or CDs because I don't really need to do that away from home. I just need an ultra-portable drive. Does such a thing exist?

—JONATHAN SCHMIDT

The Doctor consulted with Plextor and learned that bus-powered USB 2.0 devices are limited to a maximum current draw of 100mA (milliamps) at startup, and 500mA after that. A Plextor optical drive can use up to 2A (amps), which is four times what a USB 2.0 port can provide (and you always want to leave plenty of headroom when dealing with power usage). This explains why the Doctor has never seen a bus-powered external optical drive either in the Lab or out in the field.

If your Tablet PC has a lot of free hard drive space, you may want to consider installing a virtual CD program and creating disk images of CDs you want to take with you (for example, you can create disk images with *Nero* and mount the images with the freeware app *Daemon Tools* available at www.daemon-tools.cc). For DVDs, you also have the option of compressing the contents into a manageable DivX or Xvid file for use on your Tablet PC (go to www.dvdrhelp.com for tons of tutorials on the subject). ■

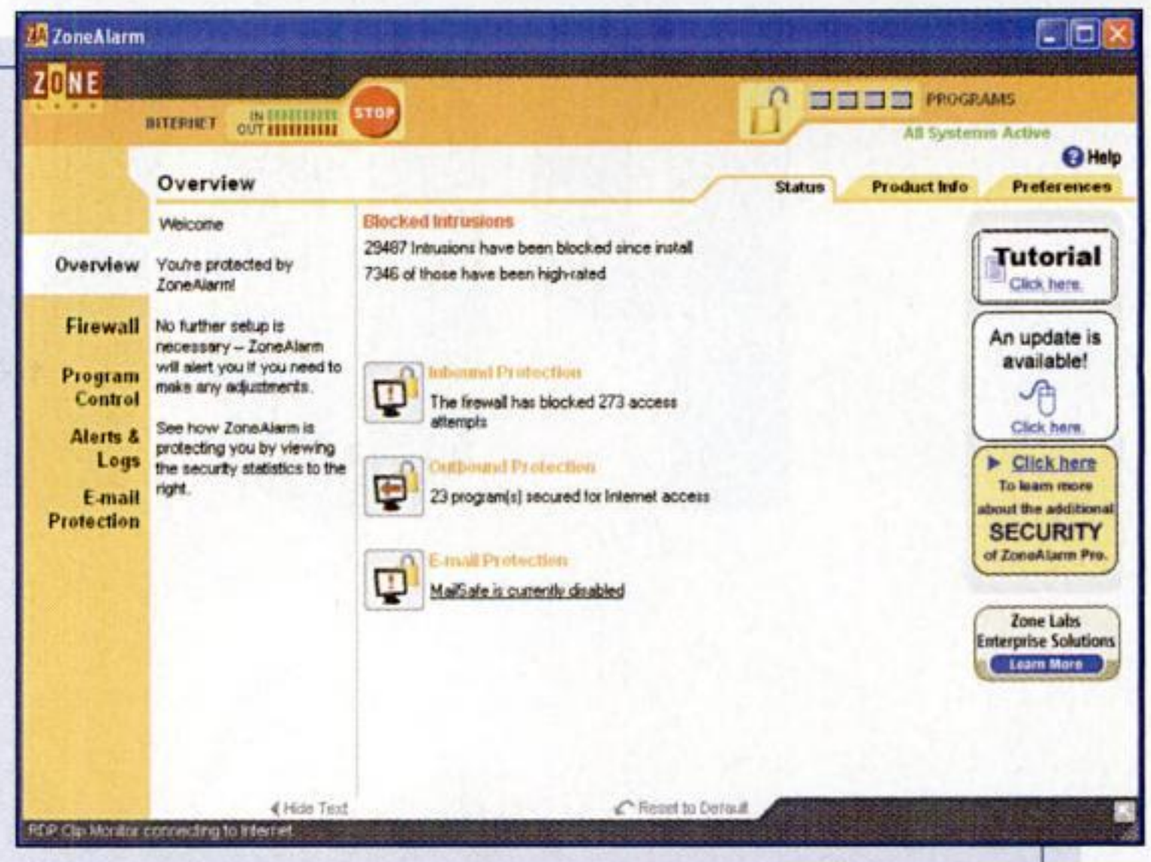
THE HARD, AND SOFT, WAY

Hey, Doc, I just set up a network in my house and have a quick question: If I have a router that comes with a built-in firewall, do I also need to run a software firewall like *ZoneAlarm*? I want to make sure I'm fully protected.

—RICK BROIDA

Strictly speaking, you don't need to run a software firewall if you have a hardware firewall in place. However, it's not a bad idea. In the event that a malicious worm gets past your firewall in the form of an e-mail attachment, a software firewall running on the PCs in your network will prevent the worm from spreading throughout your LAN.

Note: If any of the computers on your network are used away from the LAN, and therefore the router's built-in firewall, they should absolutely run a software firewall for protection.



Even if you have a hardware firewall, it isn't a bad idea to also run a software firewall like *ZoneAlarm*, especially on any machine that's used beyond the safe haven of your LAN.

Like a peaceful Native American bringing fish and fowl to starving settlers, the Doctor is here to grace you with PC repair advice from his vast cornucopia of knowledge. As always, if you have PC problems, send the Doc an e-mail at doctor@maximumpc.com.

Copyrighted material

POWER

REDEFINED

The thrill of victory was never quite so scintillating. The cutting edge features of Antec's NeoPower let you take maximum advantage of all the latest technology—now. Like an advanced cable management system. Native support for PCI-Express graphics cards. Full ATX12V v2.0 compliance. Plus 480 Watts of supremely stable power with a single 120mm fan for virtually silent operation. And that's just the beginning. For the complete story on NeoPower 480 visit www.antec.com or your local Antec retailer today.

Antec
The Power of You

BEST BUY amazon.com STAPLES newegg.com J&R

Copyrighted material

Some people are kinda nuts. Their malformed cerebellums (that's 'brains' for those of you who skipped Bio class) compel them to game wherever they can. Hey, we're kinda nuts ourselves. That's why our portable Super LANBOY case packs all kinds of gravity-defying goodies. Like a lightweight anodized aluminum body. A free carrying strap. Plus nine drive bays and two 120mm fans. So game wherever you want. Just use a safety net, OK? To learn how we can help you lift your game to a higher level, visit www.antec.com.

Antec
The Power of You

circuit city · COMPUSA WHERE AMERICA BUYS TECHNOLOGY. · CDW · MICRO CENTER THE COMPUTER DEPARTMENT STORE · buy.com

Copyrighted material

In the Lab

A behind-the-scenes look at Maximum PC testing

3DMark05: Tough on Videocards

On the eve of releasing a brand-new version of its *3DMark* test, Futuremark explains what's new—and why

A Gatling-gun wielding soldier assaults a space station in Demo 1 of the new *3DMark05*.

Game 3 features a Jules Verne-like airship flying through a beautiful water-filled valley.

For benchmark fiends, this has been one hell of a summer. First came id's system-stressing *Doom 3*, and now Futuremark is close to releasing its latest benchmark opus: *3DMark05*, which is built to bring even the fastest videocards to their knees.

The new release of one of *Maximum PC's* favorite benchmarks includes only three main scenes, but each is far more powerful than anything we've seen before. *3DMark05* uses Shader Model 3.0 but will bump down to earlier shader models if a card is incapable of the higher version. (Currently, only nVidia's 6-series cards are capable of Shader Model 3.0.) Users can manually choose among Pixel Shader 2.0, 2.a, 2.b and Vertex Shaders 2.0 and 2.a.

While the audio performance test in *3DMark03* has been dropped, the CPU tests remain and have been made even more substantial. Although we had permission to test with the beta version, we're going to wait until we see the final code before rendering any public judgments on its capabilities as a benchmark. A recent chat with Futuremark revealed some interesting facts about the upcoming benchmark:

MPC: What gets lost when a videocard is running Pixel Shader 2.0 instead of 3.0?
FM: Nothing. The rendering quality is exactly the same when using Pixel Shader 2.0 or Pixel Shader 3.0. The only possible difference is performance, as PS3.0 can do some shaders with fewer instructions than PS2.x. The difference becomes even less evident if the Pixel Shader 2.x card is capable of PS2.a or PS2.b performance.

MPC: What videocard features are you testing in *3DMark05*?
FM: Basically pixel shaders, vertex shaders, and other features exposed in DirectX9.0c. We try to stay away from the specific features of independent hardware vendors (IHV) as it wouldn't be an apples-to-apples comparison.

MPC: How do you balance nVidia's Shader Model 3.0 versus ATI's Shader Model 2.x?
FM: Of course, we have tried to maximize all shaders' performance, as the newer shader models (PS2.a, PS2.b, and PS3.0) can do longer shaders in one pass, but still the shaders are designed for SM2.0. As we said earlier, the SM3.0-capable cards may benefit from a performance increase because some shaders can be done with fewer instructions while still maintaining the same rendering output/quality. We haven't made any specific IHV optimizations, so as more cards come out that are capable of SM3.0, they will automatically use SM3.0.

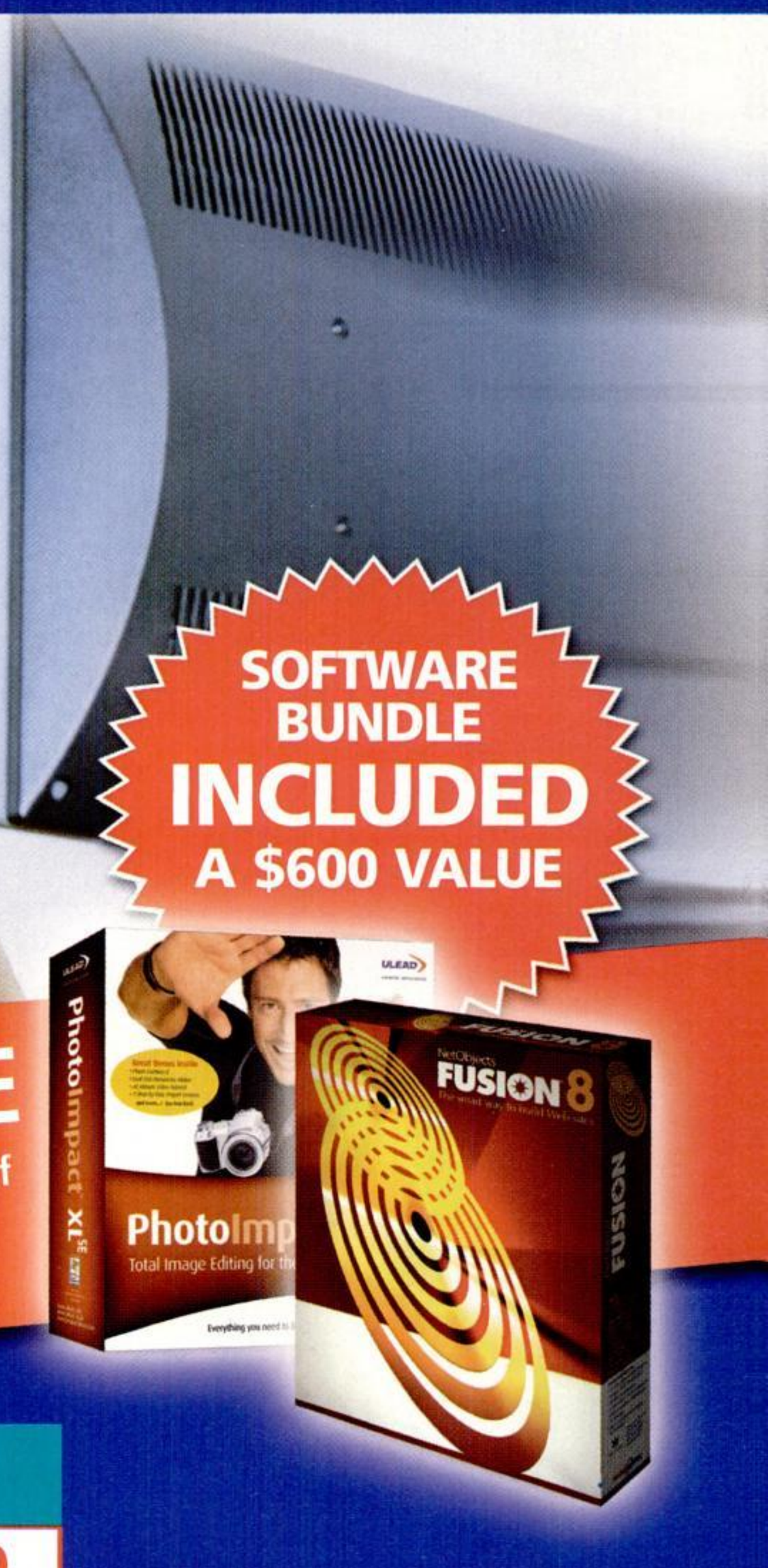
MPC: How does the CPU test work? Are there AI or physics calculations?
FM: The CPU tests are much like those in *3DMark03*, with one exception. In one of the tests, the CPU not only calculates the vertex shaders, but also continuously calculates the flight path of the air ship. The air ship actually flies the same path every time, but the calculations are performed as if it would intelligently steer according to the canyon shape and other obstacles (like the sea monster jumping up from the water).

MPC: How are the visual quality tests in *3DMark05* different from that of previous versions?
FM: We have improved all the image quality tools from *3DMark03*. We have added more options and settings, and we combined the filtering test tool with an antialiasing quality tool. We think the image quality tools in *3DMark05* are top notch, and very useful when comparing different graphics cards' image quality, filtering quality, and antialiasing quality.

A free version of the benchmark should be available by the time you read this, with a pro version costing $19.95.

Copyrighted material

BUILD YOUR ULTIMATE WEBSITE WITH THE WORLD'S #1 WEB HOST



SOFTWARE BUNDLE INCLUDED
A $600 VALUE

PREMIUM SOFTWARE INCLUDED!

Featuring new versions of NetObjects Fusion® and PhotoImpact®.

See inside for details.

REGISTER DOMAINS:
.COM, .NET, .ORG, .INFO, .NAME, .US

UP TO 25 FREE .INFO DOMAINS!

$5.99 PER YEAR

1&1 INSTANT MAIL	ALL-INCLUSIVE WEB HOSTING	TURNKEY eSHOPS	DEDICATED SERVERS
$0.99 PER MONTH	FROM $4.99 PER MONTH	FROM $9.99 PER MONTH	FROM $49 PER MONTH

1&1

Copyrighted material

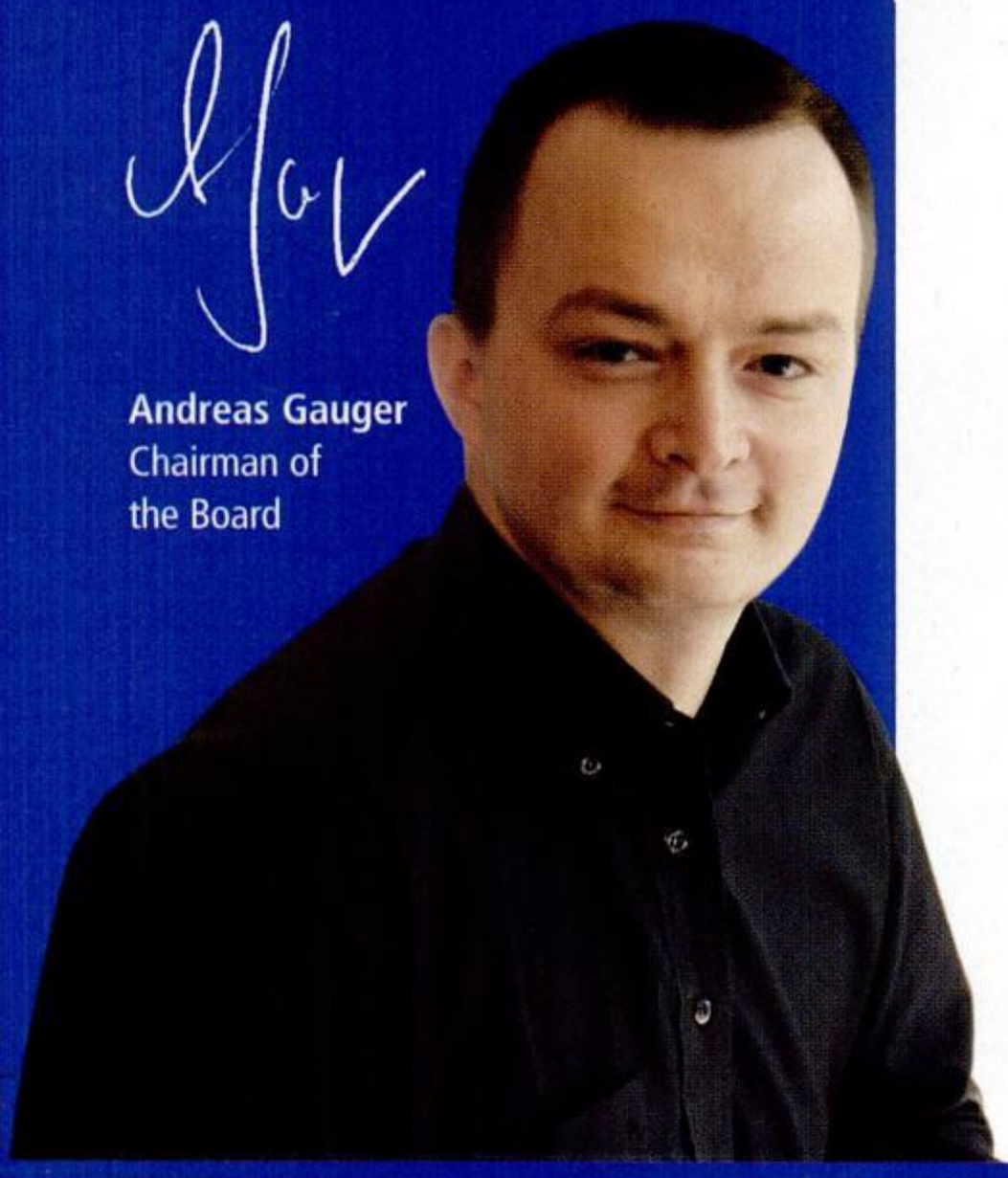
1&1 – GET MORE F

"Enabling all of our customers to do more on the web is our #1 priority."

1&1 offers a one-stop shop for all your web hosting needs to help you maximize your full web potential – without barriers, without downtime and without reservation. When you join 1&1, you'll benefit from more reliability, more features, more performance and more service – but at affordable prices.

1&1 is dedicated to our customers' complete satisfaction. From total beginners to veteran industry professionals, all users are fully supported. And since we stand behind all of our products and services, we offer a 90-day Money Back Guarantee in case you're not 100% satisfied.

Sign up with 1&1 today and join the 3 million customers who understand what makes 1&1 the world's #1 web host.



Andreas Gauger
Chairman of
the Board

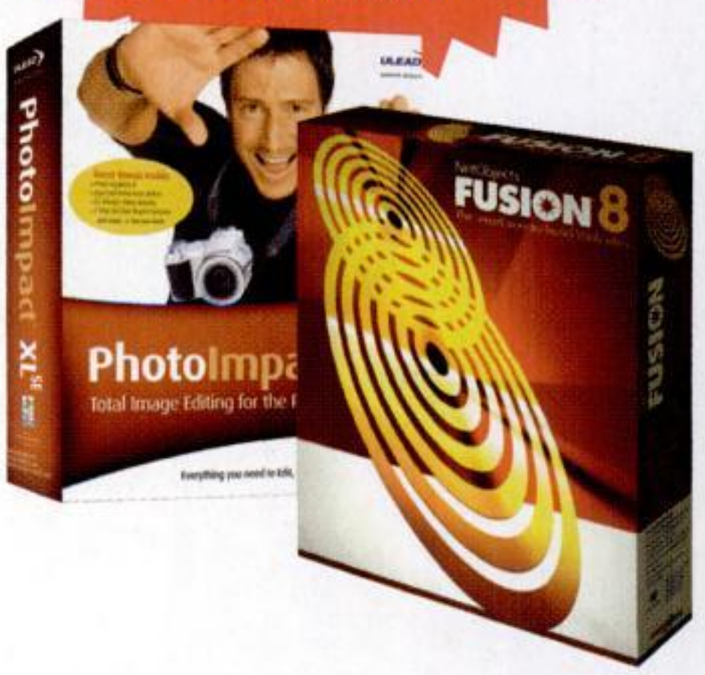
All-Inclusive Plans with No Hidden Charges

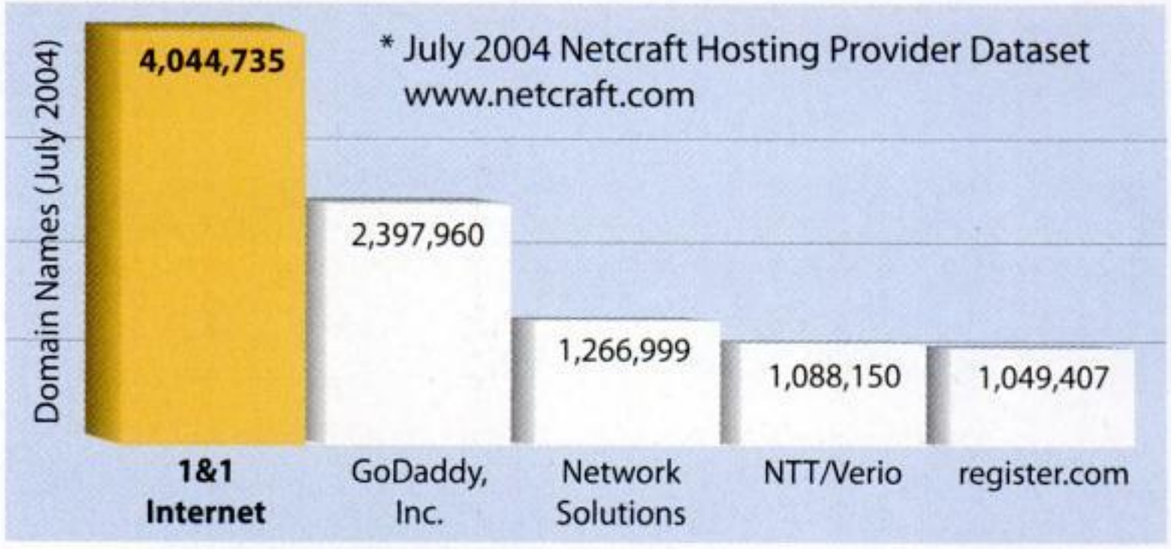
At 1&1, we don't believe you should have to pick and choose the features you require. So we provide you with everything you need in one comprehensive package, at one low price. And the price you see is always the price you'll pay! There are never any hidden charges with 1&1.

$600 Software Bundle with NEW VERSIONS of PhotoImpact® and NetObjects Fusion®!

NetObjects Fusion and PhotoImpact just got better! Gain more control with the user-friendly NetObjects Fusion 8 and build a website without HTML knowledge! Achieve professional results without the steep learning curve with PhotoImpact XL SE total image editor. Simply sign up for any shared hosting plan, eShop or server and we'll include NetObjects Fusion 8, PhotoImpact XL SE and much more (a $6.99 shipping & processing fee applies) to create, publish, promote and optimize your ideal website – a $600 value!

$600 SOFTWARE BUNDLE INCLUDED
WITH ALL SHARED HOSTING, eSHOPS & SERVERS.
Featuring New Versions of PhotoImpact® and NetObjects Fusion®.





Here is how 1&1 stacked up against the other large domain providers.

1.877.GO1AND1

Copyrighted material

OR LESS!

Advanced Data Centers

25,000 high-end servers are stationed in continually monitored high-security zones.

18,000 MBit Connectivity

18,000 MBit connectivity lets more people visit and interact with your website, faster.

24/7 Support

All customers receive friendly, professional technical support by e-mail and phone.

Strong Partnerships

Microsoft CERTIFIED Partner

Working with such partners as Microsoft means 1&1 offers the very latest in technology.

Satisfaction Guaranteed

Try our products risk free for 90 days. If you're not 100% satisfied, you'll be refunded.

Reliability Guaranteed

We are confident in guaranteeing 99.9% uptime, because at 1&1, even our backups have backups.

1&1 INSTANT DOMAIN

Domain in an Instant!

Register Your Domain
It's fast, it's easy, and it's only the beginning of what you can accomplish online with 1&1. DNS management gives you full control over your domain. What's more, we assure you there are no hidden charges and no binding contracts.

Transfer Your Domain
Quickly and easily transfer unlimited domains to 1&1 at no additional cost. We only charge you the regular low cost to register a domain – just $5.99 a year. If you have a domain that you'd like to keep with another Registrar, simply point your domain to 1&1 name servers – also at no additional cost!

Included at no additional cost with all domains:

- **DNS management**
- **DNS transfer**
- **Transfer existing domains at no additional cost**
- **1 free e-mail address (alias)**
- **Unlimited e-mail forwarding**
- **Masked website forwarding**
- **Domain parking for future use**
- **Catch-all e-mail**
- **E-mail auto-responders**
- **Simple access via the 1&1 Control Panel**

.COM, .NET, .ORG, .INFO, .NAME, .US

LIMITED-TIME OFFER: UP TO 25 FREE .INFO DOMAINS!

$5.99 PER YEAR

Afilias Co-founder & Accredited Registrar · ICANN Accredited Registrar · dot name

GO TO **WWW.1AND1.COM**

1&1

Copyrighted material

1&1 MAIL

1&1 gives you two great ways to get mail.

Whether you need e-mail for personal use or business use, 1&1 has the perfect solution for you. 1&1 Instant Mail is ideal for home and individual users, allowing you to start sending and receiving personalized e-mails right away from 5 dedicated POP3 e-mail accounts. 1&1 Microsoft Exchange Hosting gives you or your entire business secure, reliable, affordable, up-to-date access to your most critical information – e-mail, contacts, calendars, public folders and more – anytime and from anywhere.

"Running a consulting company, I can be working from several locations each day. With 1&1's Microsoft Exchange service, I can easily access my Outlook data and important files from any computer. Whether I am on my desktop, notebook, PDA, or a client's computer, my work environment is synchronized with 1&1. For my small businesses maintaining my own Microsoft Exchange server had always been too costly or too difficult. With 1&1's service, it is now simple and affordable to work and share information virtually anywhere."

Michael Krupit

1.877.GO1AND1

Copyrighted material

MONEY BACK GUARANTEE

90-DAY MONEY BACK GUARANTEE

100% SATISFACTION OR YOUR MONEY BACK

1&1 INSTANT MAIL

Mail in an Instant!

What does your ambiguous e-mail address say about you? Are you ready to take your personal e-mail to a more professional level? Then 1&1 has your solution. Simply register your domain with 1&1 and then add on 1&1 Instant Mail. In just minutes you'll have the power to send and receive e-mail from your own domain name.

- **5 POP3 e-mail accounts (50 MB each)**
- **10 e-mail aliases**
- **Includes 1&1 WebMail – access mail anytime, from any browser**
- **Send and receive e-mail from your domain**
- **Easy setup via your Control Panel**

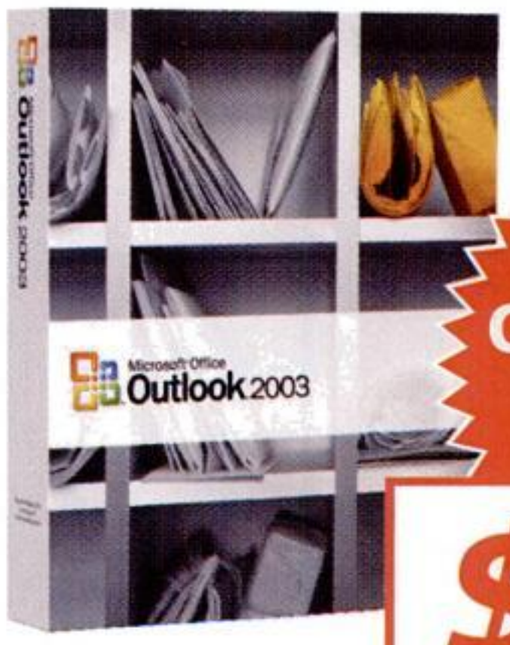
$0.99 PER MONTH

1&1 EXCHANGE HOSTING

Exchange made easy!

Your Microsoft Exchange Hosting Plan from 1&1 lets you enjoy the communication and collaboration features and benefits of Microsoft Exchange without the hassles of maintaining your own Microsoft Exchange server. Read, send and receive e-mail and access your public folders, contacts and calendars at anytime, from anywhere via Microsoft Outlook® or any web browser.

- **1 Exchange account for 1 user**
- **500 MB e-mail storage space**
- **Group functionality tools**
- **Outlook® Web Access**
- **Virus Scanner**
- **Synchronize your data with ActiveSync**



With all Exchange packages **OUTLOOK 2003 INCLUDED**

*$6.99 shipping & processing fee applies.

$6.99 PER MONTH

Includes 24/7 support • No setup fee

GO TO **WWW.1AND1.COM**

1&1

Copyrighted material

1&1 HOSTING

Create Your Own Website

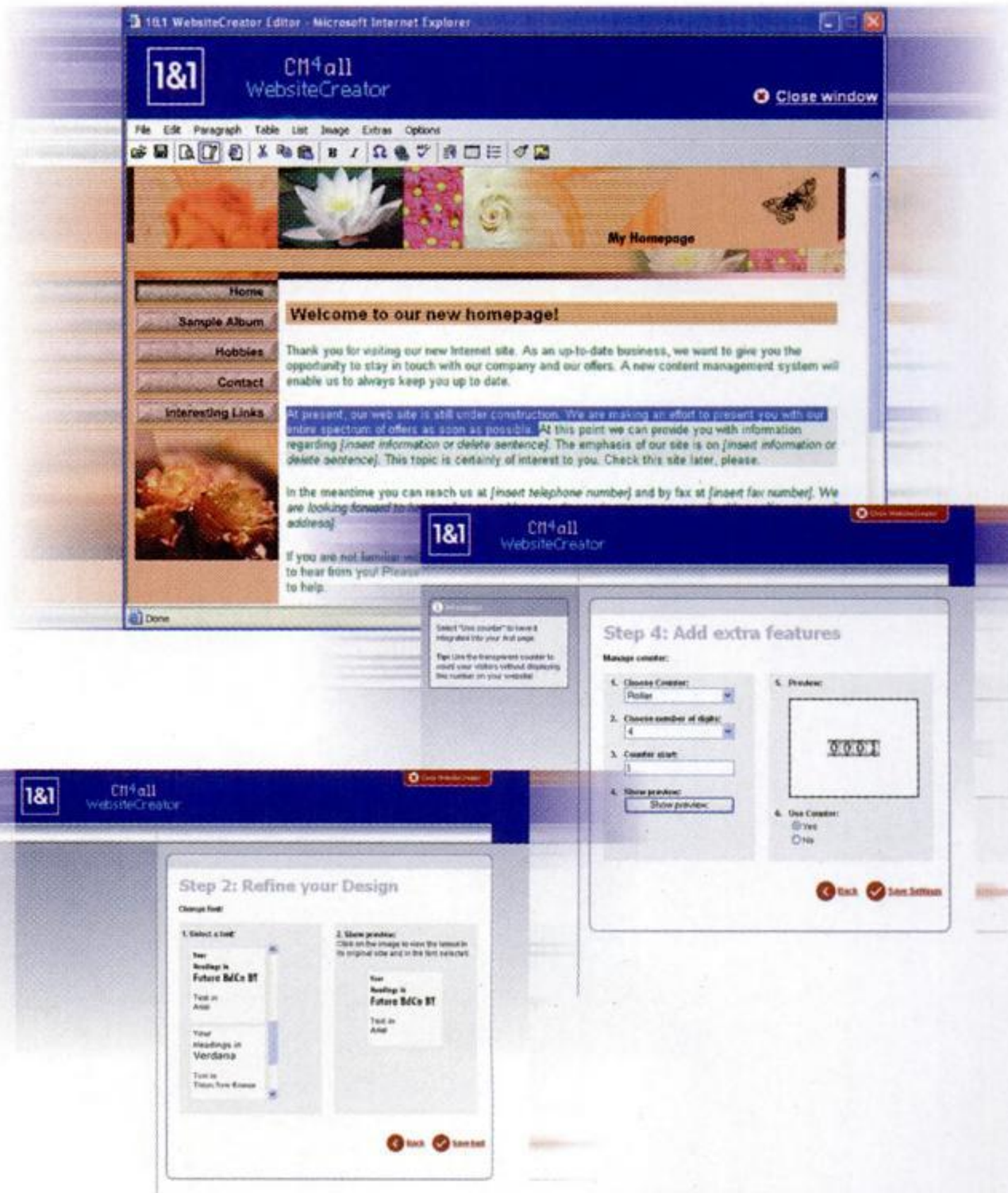
1&1 gives you everything you need to easily build your ultimate website.

Build your ideal web presence – with the latest software and online tools from 1&1. When you sign up for 1&1 shared hosting, we give you two ways to create your site – our valuable software bundle or the easy-to-use WebsiteCreator. Whether you're a novice user or a veteran online professional, the 1&1 software package and WebsiteCreator give you the power to create a high-impact, professional website. No matter which you use, WebsiteCreator or the software bundle, we give you exactly what you need to easily, effectively and economically make your presence online.

WebsiteCreator

Quickly and easily create and publish a high-quality website with no HTML knowledge needed.

- From start to finish, a fully functioning website online in just 5 easy steps.
- Choose from 120 professionally designed templates.
- Launches right from the 1&1 Control Panel – no software to install.



1.877.GO1AND1

Copyrighted material

$600
SOFTWARE BUNDLE
INCLUDED
WITH ALL SHARED HOSTING.

Featuring New Versions of
PhotoImpact® and
NetObjects Fusion®.

1&1 Software Bundle – a $600 value*

Sign up for any 1&1 shared hosting plan and we'll include NetObjects Fusion® 8, PhotoImpact® XL SE and much more so you can create, publish, promote and optimize your ideal website. And these are not limited-time trials – you'll be shipped a software CD plus manuals for:

NetObjects Fusion 8

Use time-saving wizards and a simple, user-friendly interface to build a website without HTML programming.

PhotoImpact XL SE

Create and edit graphics and photos like a pro, but without the steep learning curve.

Hello Engines! Professional 4.1

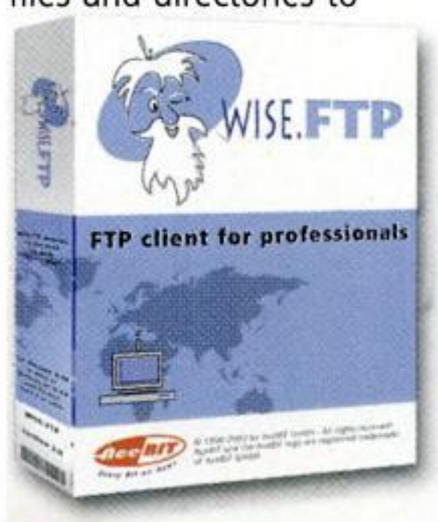
Reliably submit your website to all the important search engines and directories.

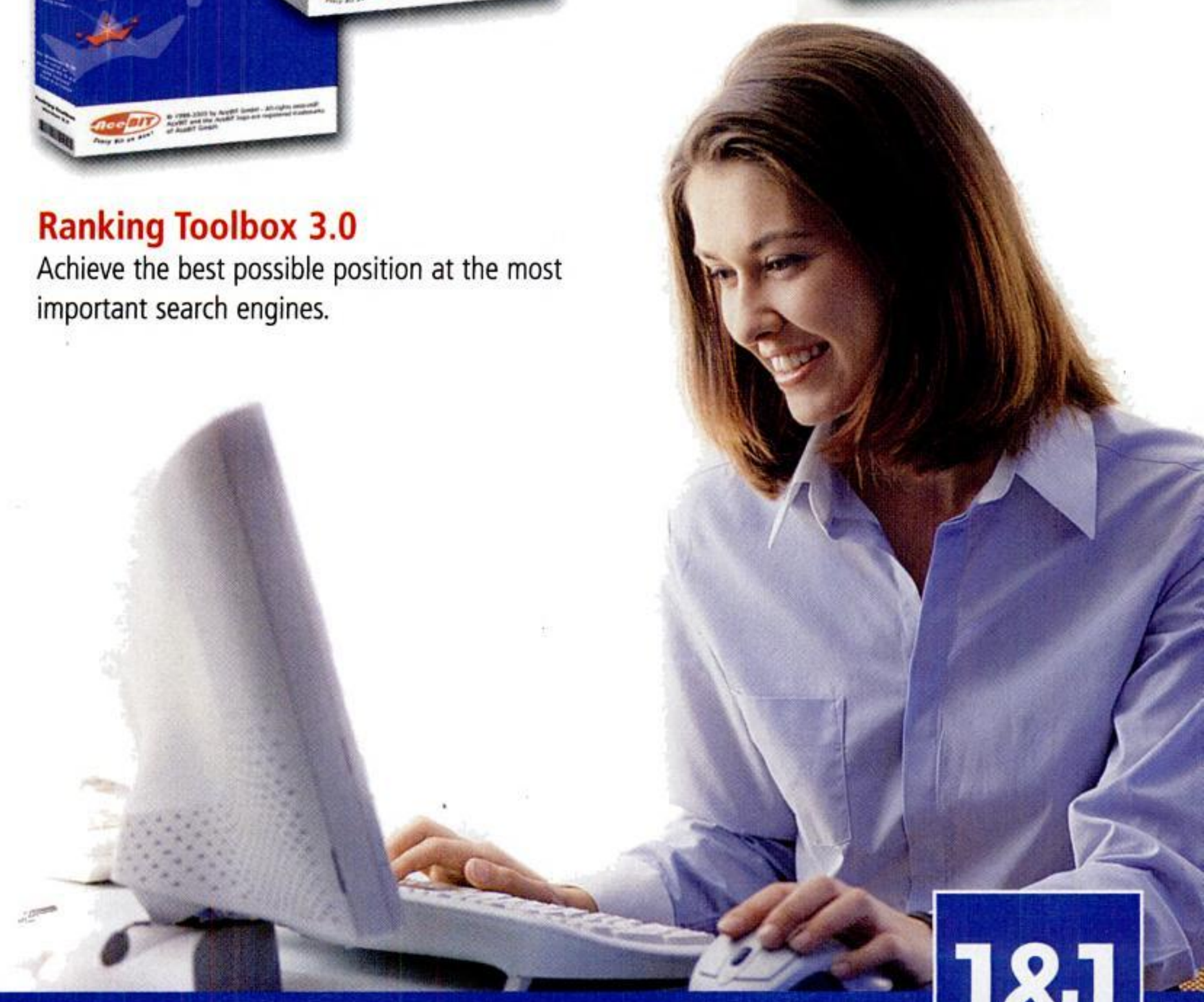
Ranking Toolbox 3.0

Achieve the best possible position at the most important search engines.

WISE.FTP

Easily publish your website by transferring your files and directories to the 1&1 server.





*$6.99 shipping & processing fee applies

GO TO **WWW.1AND1.COM**

1&1

Copyrighted material

1&1 HOSTING

Market Your Own Website

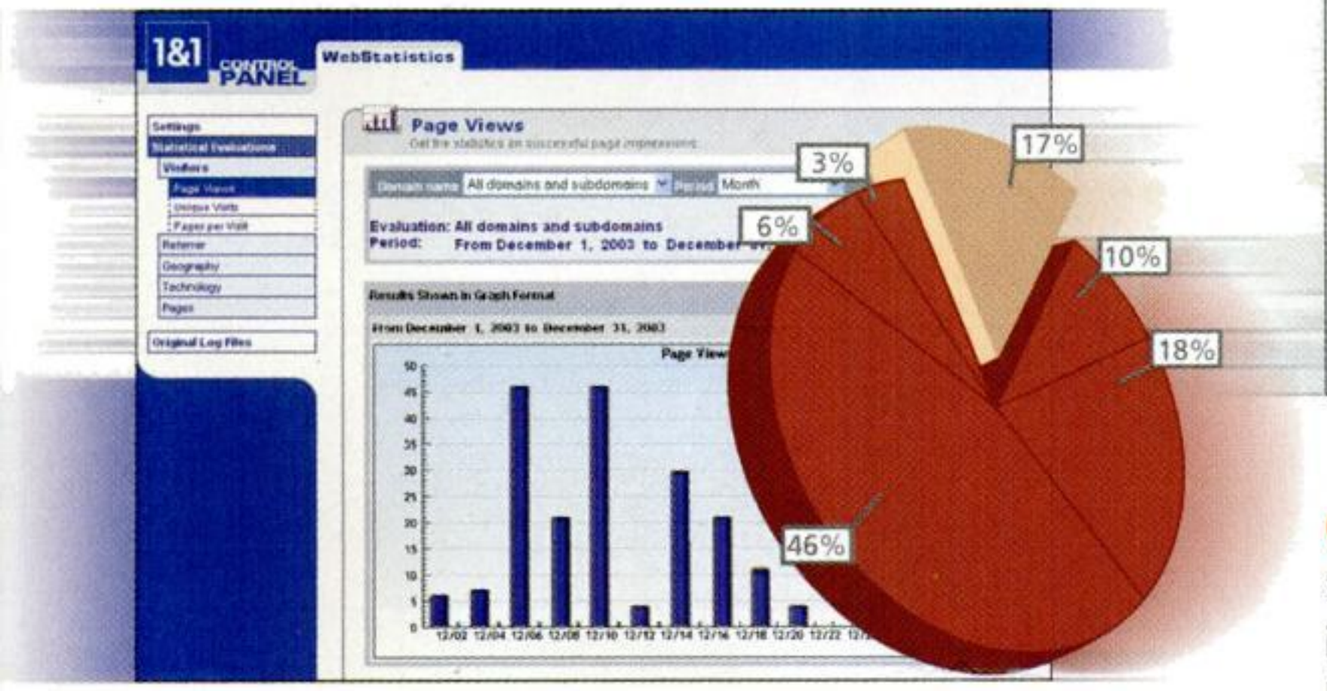
Make your site interactive and increase communication using 1&1 tools.

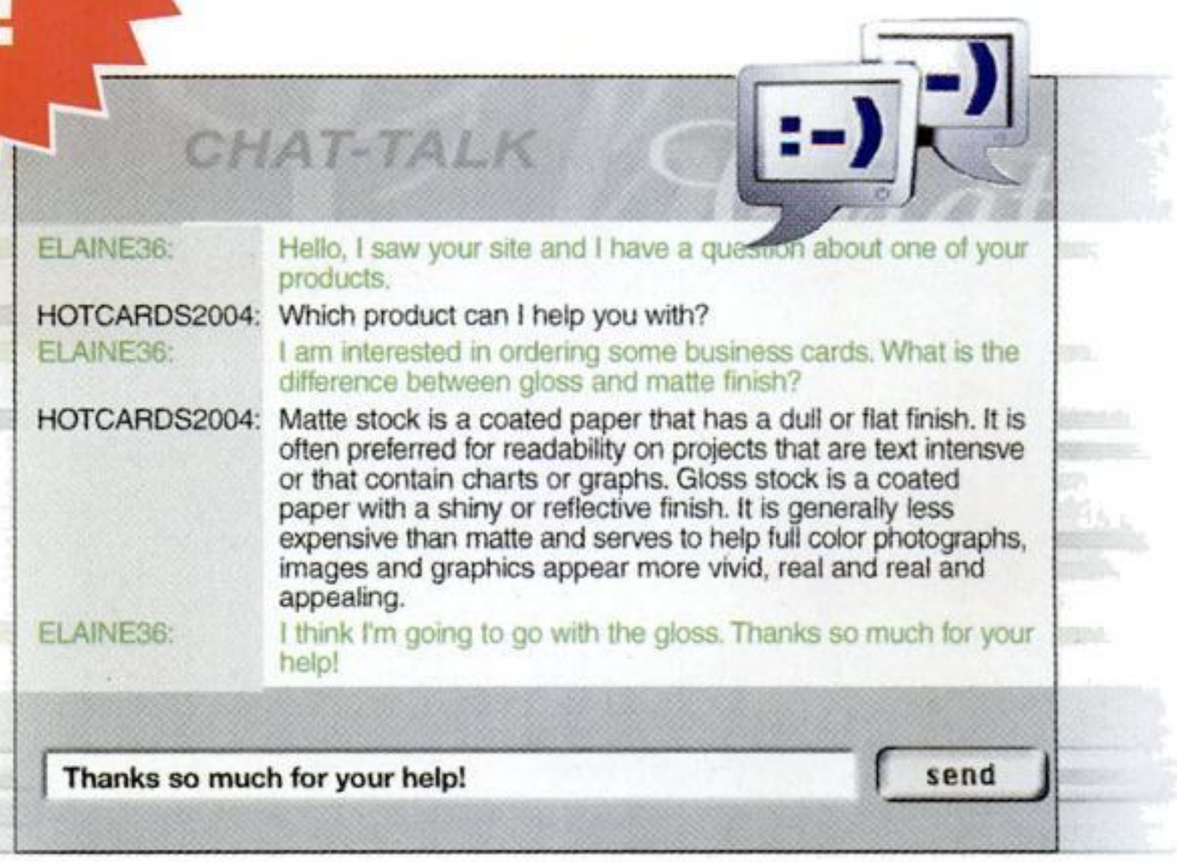
Easily add features to enhance your website. 1&1 gives you the tools that let you effectively communicate with your customers and site visitors, keep them intrigued and keep them coming back for more. Your 1&1 hosting package comes complete with high performance features that let you connect with your visitors through live interaction, feedback forms, e-mail newsletters and more and gives them exactly what they are looking for. Best of all, these tools are so easy to use that no programming knowledge is needed!

ALL WEB TOOLS INCLUDED AT NO ADDITIONAL CHARGE!*

1&1 WebStatistics

Use comprehensive statistics to understand visitor dynamics and adapt your site to your visitors. Included with ALL shared hosting plans!





Chat & Forum

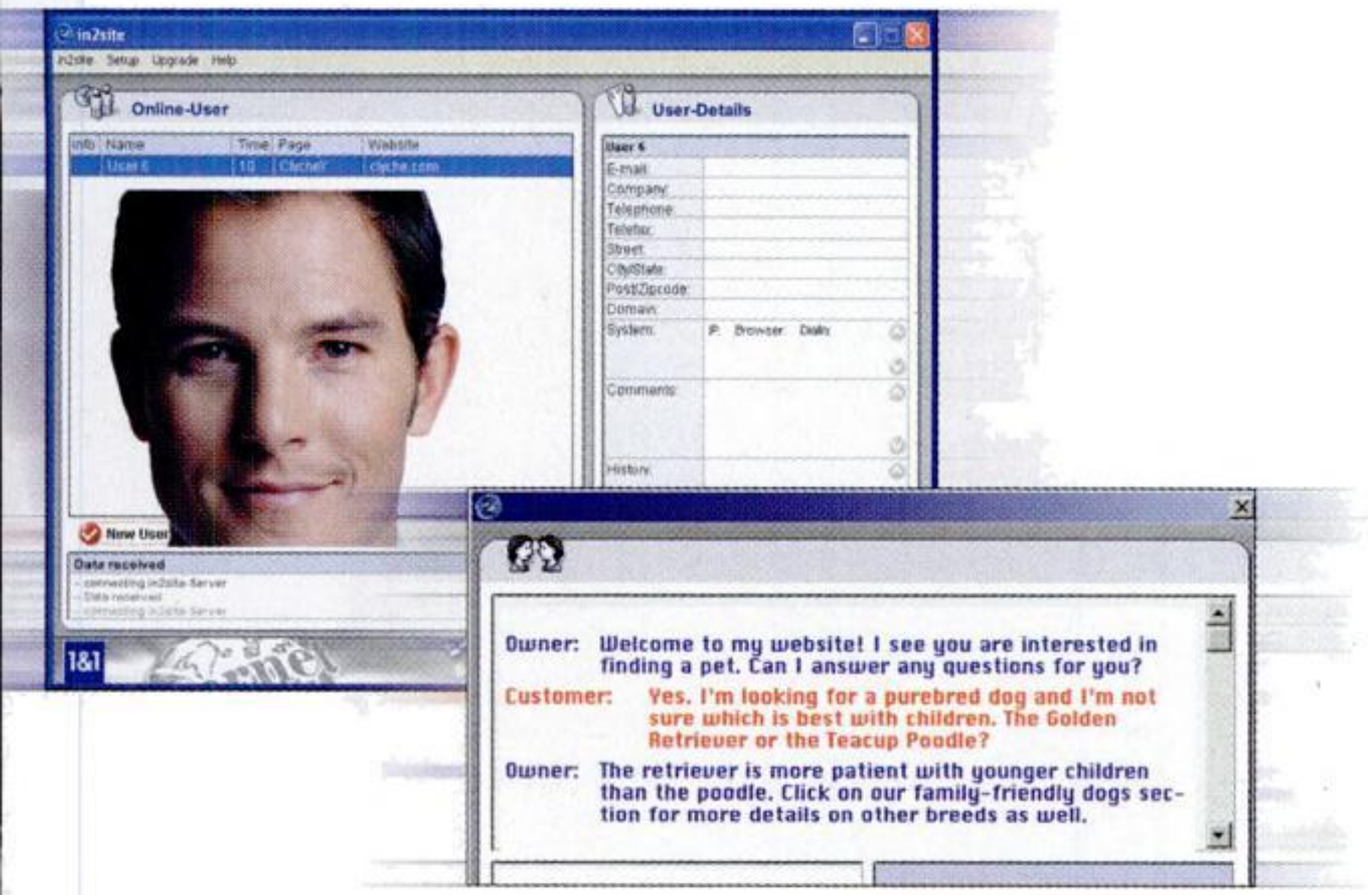
Provide a meeting place for your customers and add information and entertainment value to your site. Included with ALL shared hosting plans!

1.877.GO1AND1

Copyrighted material

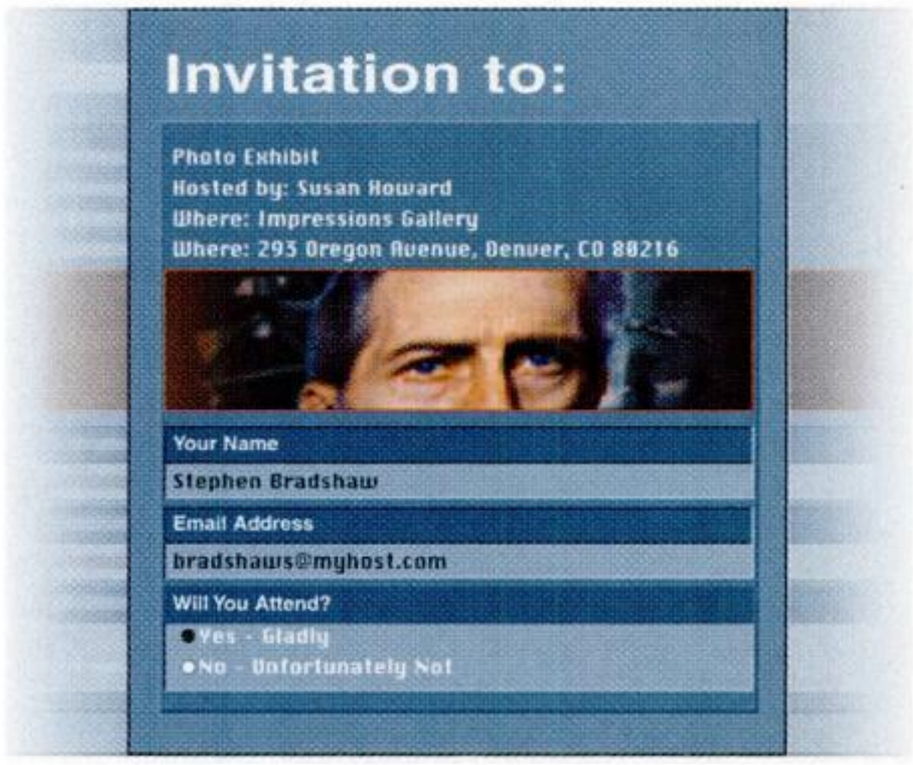
In2site Live Dialogue*

Give site visitors personalized customer service and support live and in real time.



1&1 WebElements*

Add template-driven contact forms, online polls and more and customize them to fit your site.



Membership List

Alan Bishop	634 E. 39th Street, New York, NY 10019	alanb@myhost.com
Stephen Bradshaw	1954 Corgin Street, Hudson, OH 44236	bradshaws@myhost.com
Catherine Leonard	64 Stanhope Drive, Pittsburgh, PA 15237	family@ myname.com
Carl Brown	653 Liberty Avenue, Wilmington, NC 28403	brownc2521@lycos.com
Tom Stowe	26 N. Hills Road, Chandler, AZ 85226	webunited@gmx.net
Helen McSweeny	817 Providence Hwy, Boston, MA 02116	helenmcsweeney@hot-mail.com

1&1 WebDatabase*

Easily create and integrate customized databases into your website with no programming knowledge needed.

1&1 Newsletter Tool*

Easily create and send professional looking e-mails to share news and information with your visitors.

*Home packages do not include WebElements, In2site Live Dialogue, WebDatabase or Newsletter Tool.

GO TO **WWW.1AND1.COM**

1&1

Copyrighted material

1&1 HOSTING

Affordable, all-inclusive, feature-packed hosting from 1&1.

1&1's Microsoft and Linux shared hosting packages offer the best value for your money. Whether you're a novice Internet user or operate a heavily trafficked site, 1&1 has a hosting package that will help you make the most of your web experience.

Home Package

Ideal for creating your family website and publishing your photos or hobbies to the Internet.

Business Package

The easy way for small and medium-sized businesses to build a sophisticated, professional web presence.

Developer Package

Packed with the latest Internet technologies to build powerful, secure and reliable web applications.

www.HighImpactNetworking.com

"When I signed up for 1&1's 3 year hosting promotion, I was skeptical, but to my delight, 1&1's services were so exceptional that I purchased a Microsoft Hosting account. 1&1's services are so reliable and affordable that I plan on purchasing additional services as my business expands."

George Alto

1.877.GO1AND1

Copyrighted material

MONEY BACK GUARANTEE

90-DAY MONEY BACK GUARANTEE

100% SATISFACTION OR YOUR MONEY BACK

$600 SOFTWARE BUNDLE INCLUDED WITH ALL SHARED HOSTING.

Featuring New Versions of PhotoImpact® and NetObjects Fusion®.

IMPROVED

HOME PACKAGE

FROM $4.99 PER MONTH

INCLUDES 1 DOMAIN

PACKAGE FEATURES		
Web space	1,000 MB	1,000 MB
FTP accounts	1	1
Monthly Transfer Volume	25 GB	25 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
1&1 Chat channels	1	1
1&1 WebStatistics	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	12 pages	12 pages
Software bundle worth $600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
DOMAIN NAMES		
Included Domains	1	1
Subdomains	10	10
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
POP3 accounts	200	200
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	1 account	1 account
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
Dedicated SSL Certificate	optional	optional
PER MONTH	$4.99	$6.99

IMPROVED

BUSINESS PACKAGE

FROM $9.99 PER MONTH

INCLUDES 3 DOMAINS

PACKAGE FEATURES		
Web space	2,000 MB	2,000 MB
FTP accounts	5	5
Monthly Transfer Volume	50 GB	50 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
1&1 Chat channels	5	5
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	18 pages	18 pages
Software bundle worth $600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
1&1 WebDatabase	✓	✓
Database	1 MySQL	MS Access
Cron Jobs	✓	–
SSI (Server side includes)	✓	✓
DOMAIN NAMES		
Included Domains	3	3
Subdomains	50	50
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
POP3 accounts	500	500
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	3 accounts	3 accounts
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	–
Dedicated SSL Certificate	optional	optional
PER MONTH	$9.99	$12.99

IMPROVED

DEVELOPER PACKAGE

FROM $19.99 PER MONTH

INCLUDES 5 DOMAINS

PACKAGE FEATURES		
Web space	4,000 MB	4,000 MB
FTP accounts	25	25
Monthly Transfer Volume	100 GB	100 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
1&1 Chat channels	10	10
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	25 pages	25 pages
Software bundle worth $600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
1&1 WebDatabase	✓	✓
Database	3 MySQL	MS Access, MS SQL
Cron Jobs	✓	–
SSI (Server side includes)	✓	✓
Advanced Developer Tools	✓	–
DOMAIN NAMES		
Included Domains	5	5
Subdomains	200	200
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
POP3 accounts	1,000	1,000
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	6 accounts	6 accounts
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	–
Dedicated SSL Certificate	✓	✓
PER MONTH	$19.99	$24.99

Includes 24/7 support • No setup fee

– Linux packages

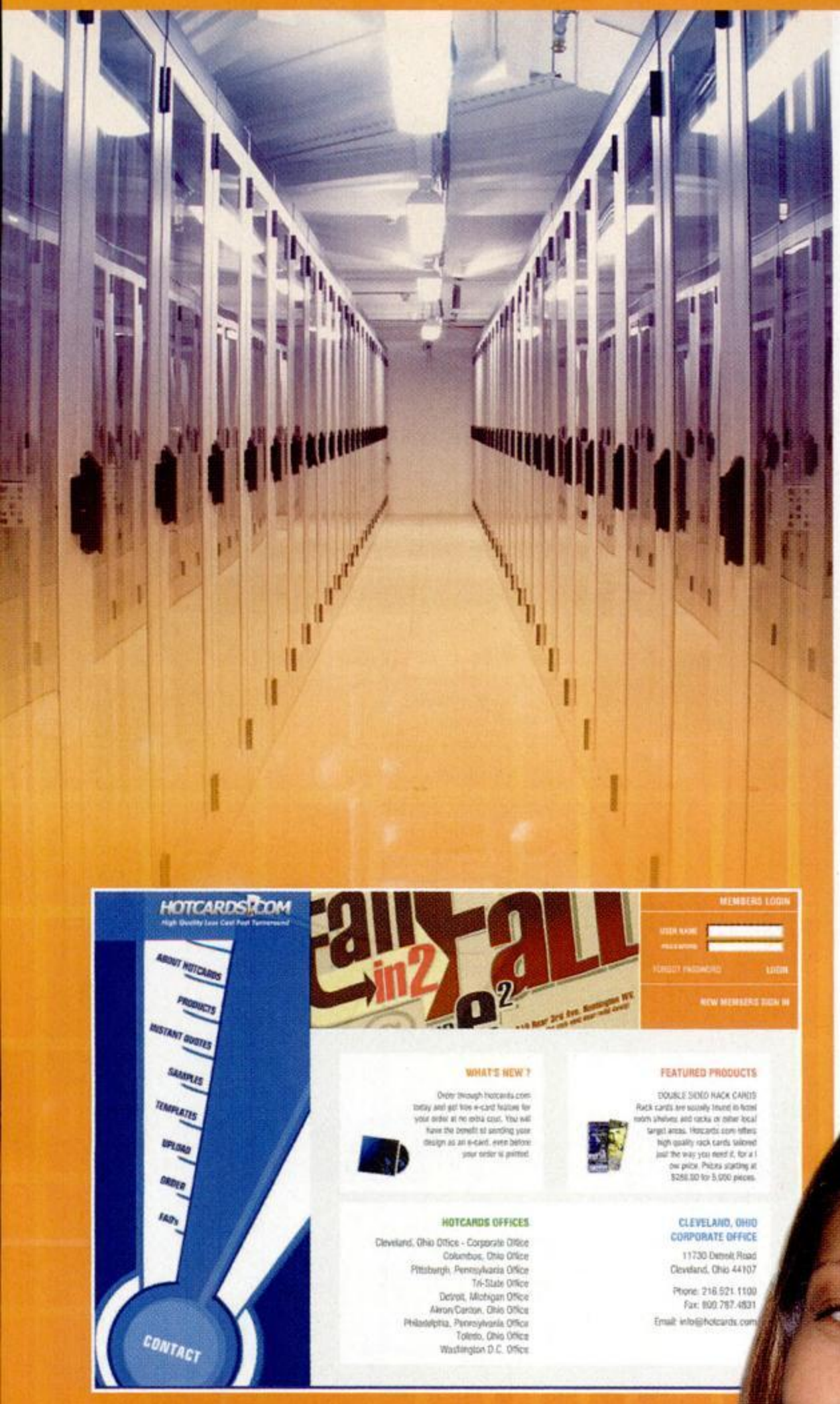
– Microsoft packages

GO TO WWW.1AND1.COM

1&1

Copyrighted material

1&1 SERVERS



Whatever you need from a dedicated server, 1&1 has the definitive solution.

Dedicated servers from 1&1 offer a broad range of functionality so you can choose the solution that best fits your needs and experience level. From a fully maintained Managed Server, to a Root Server with maximum flexibility and control, to a solid and secure Windows Server, 1&1 will help you take your web presence to the next level.

$25 Million Data Centers

- 99.9% uptime guaranteed
- 18,000 MBit connectivity
- 500 peerings with 250 different providers for optimized routing

Fully Managed Servers

- As easy as shared hosting but with added power and performance
- Complete monitoring, management and maintenance by 1&1
- Security updates and system maintenance
- Server configured and installed by 1&1

Windows Server: Web Edition

- Included with Windows Server I & II
- Designed for dedicated web serving and hosting
- Remote Desktop Control
- ASP, ASP.NET, MSDE

Windows Server: Standard Edition

- Included with Windows Server III
- Designed to support sophisticated and demanding applications
- Exchange Server installable
- Includes Active Directory, Streaming Media Server, Terminal Services

Plesk 7 Reloaded Included with All Root Servers

- Use, create and manage your Linux-based system
- Create new e-mail accounts
- Manage web spaces plus up to 100 domains
- Become your own host by partitioning your server into shared web space

www.hotcards.com

"Moving to 1&1's Managed Server III has made our business much more efficient. 1&1 gives us our own dedicated server, but we still get the seamless, maintenance-free service of a shared hosting site. Plus, we get all the space we need for our high resolution graphics files and print samples."

Nikki Woodruff

1.877.GO1AND1

Copyrighted material

MONEY BACK GUARANTEE

90-DAY MONEY BACK GUARANTEE

100% SATISFACTION OR YOUR MONEY BACK

$600 SOFTWARE BUNDLE INCLUDED WITH ALL SERVERS.

Featuring New Versions of PhotoImpact® and NetObjects Fusion®.

1&1 ROOT SERVERS

For Maximum Flexibility and Control

- Plesk 7 Reloaded Control Panel pre-installed
- RedHat Linux 9 Operating System
- Advanced Recovery Tool lets you instantly reboot

PLESK7 RELOADED

1&1 MANAGED SERVERS

For Performance and Convenience

- All the features of shared hosting with the power of a dedicated server
- Continuously updated firewall protection
- 1&1 user-friendly Control Panel for easy administration
- Includes Dedicated SSL Certificate at no extra cost

1&1 WINDOWS SERVER 2003

For Security and Reliability

- Windows Server 2003 Standard Edition with Server III (Web Edition with Server I & II)
- Unlimited administration access
- .NET Framework already integrated

	1&1 ROOT SERVERS	1&1 MANAGED SERVERS	1&1 WINDOWS SERVER 2003
SERVER I ■ Intel Celeron 2.0 GHz ■ 256 MB DDR-RAM ■ 40 GB IDE hard drive ■ 500 GB bandwidth included	$49 PER MONTH	$59 PER MONTH	$69 PER MONTH
SERVER II ■ Intel Pentium 4, 2.4 GHz ■ 512 MB DDR-RAM ■ 40 GB IDE hard drive ■ 500 GB bandwidth included	$69 PER MONTH	$79 PER MONTH	$89 PER MONTH
SERVER III ■ Intel Pentium 4, 3.06 GHz Processor with Hyper-Threading ■ 1 GB DDR-RAM ■ 120 GB IDE hard drive ■ 500 GB bandwidth included	$99 PER MONTH	$109 PER MONTH	$129 PER MONTH

Includes 24/7 support • $99 one-time setup fee

GO TO **WWW.1AND1.COM**

1&1

Copyrighted material

1&1 eSHOPS

Easy, yet sophisticated e-commerce solutions.

1&1 eShops are as powerful as any major online retailer, but with no software or hardware to install. Online wizards and a wide range of professionally designed templates offer such simplicity that your online shop can be up and running in less than an hour. Plus, 1&1 eShops are fully compatible with your current site, regardless of which hosting provider you use. 1&1 eShops include all the web space and bandwidth you need and require no additional hosting plan to get your online storefront open for business.

shop.gitanosoftware.net

"A great experience is what we have encountered with our new 1&1 Developer eShop. 1&1 gives us exceptional value, high quality, and a level of customization that we never had before. With very little effort we can offer discounts, purchase orders and more."

Jesus F. Moreno

$600 SOFTWARE BUNDLE INCLUDED WITH ALL eSHOPS.

Featuring New Versions of PhotoImpact® and NetObjects Fusion®.

1.877.GO1AND1

Copyrighted material

MONEY BACK GUARANTEE

90-DAY MONEY BACK GUARANTEE

100% SATISFACTION OR YOUR MONEY BACK

30+ professional shop templates

- Ready to be loaded with your products
- Designed by experts
- Customizable with different fonts, colors and positioning
- Easy, economical and fast

Online payments via PayPal and WorldPay

- Secure
- Easy to use
- No merchant account necessary with PayPal
- Connect with 35,000 loyal PayPal users – with no paperwork or bank application

8 easy-to-use wizards

- Step-by-step guides
- Quickly and simply configure:
  - Shopping basket
  - Order processing
  - Tax clearing
  - Delivery methods
  - Payment settings

All-inclusive hosting solution

- No software installation
- Traffic and web space included
- Updates and enhancements handled automatically
- 1&1 WebStatistics included

SSL secured

- All shop-based settings created in SSL secured pages
- Maximum integrity of confidential data
- Fully protected from third-party access

Froogle Search

Help your customers find your online products quickly and easily. Available with 1&1 Professional and Developer eShops, Froogle allows users to find the products they want and provides links to the stores that sell them. Users can click through to your business and buy direct from you.

Google Conversion Tracking

1&1 eShops support Google Conversion Tracking! Identify the effectiveness of your AdWords campaigns and make better decisions about the ads and keywords in which you invest. Receive detailed statistical reports outlining trends – from the campaign to the keyword level.

BUSINESS eSHOP

- 50 MB web space
- 10 GB monthly transfer volume
- 50 item product catalog
- Choice of 2 shipping methods

$9.99 PER MONTH

PROFESSIONAL eSHOP

- 300 MB web space
- 30 GB monthly transfer volume
- 200 item product catalog
- Unlimited item variants
- Choice of 5 shipping methods
- Multi-currency support
- Newsletter editor
- Import/export customer data
- Online credit card clearing with PayPal and WorldPay
- Tax clearing server (calculates taxes by state, county and city)

$29.99 PER MONTH

DEVELOPER eSHOP

- 1200 MB web space
- 60 GB monthly transfer volume
- Unlimited item product catalog
- Unlimited number and depth of sub-categories
- Unlimited shipping methods
- Multi-currency support
- Newsletter editor
- Import/export customer data
- Online credit card clearing with PayPal and WorldPay
- Tax clearing server (calculates taxes by state, county and city)
- FTP access
- Customer account management
- Fully customizable templates
- Dedicated SSL Certificate included
- In2site Live Dialogue

$49.99 PER MONTH

Includes 24/7 support • No setup fee

GO TO **WWW.1AND1.COM**

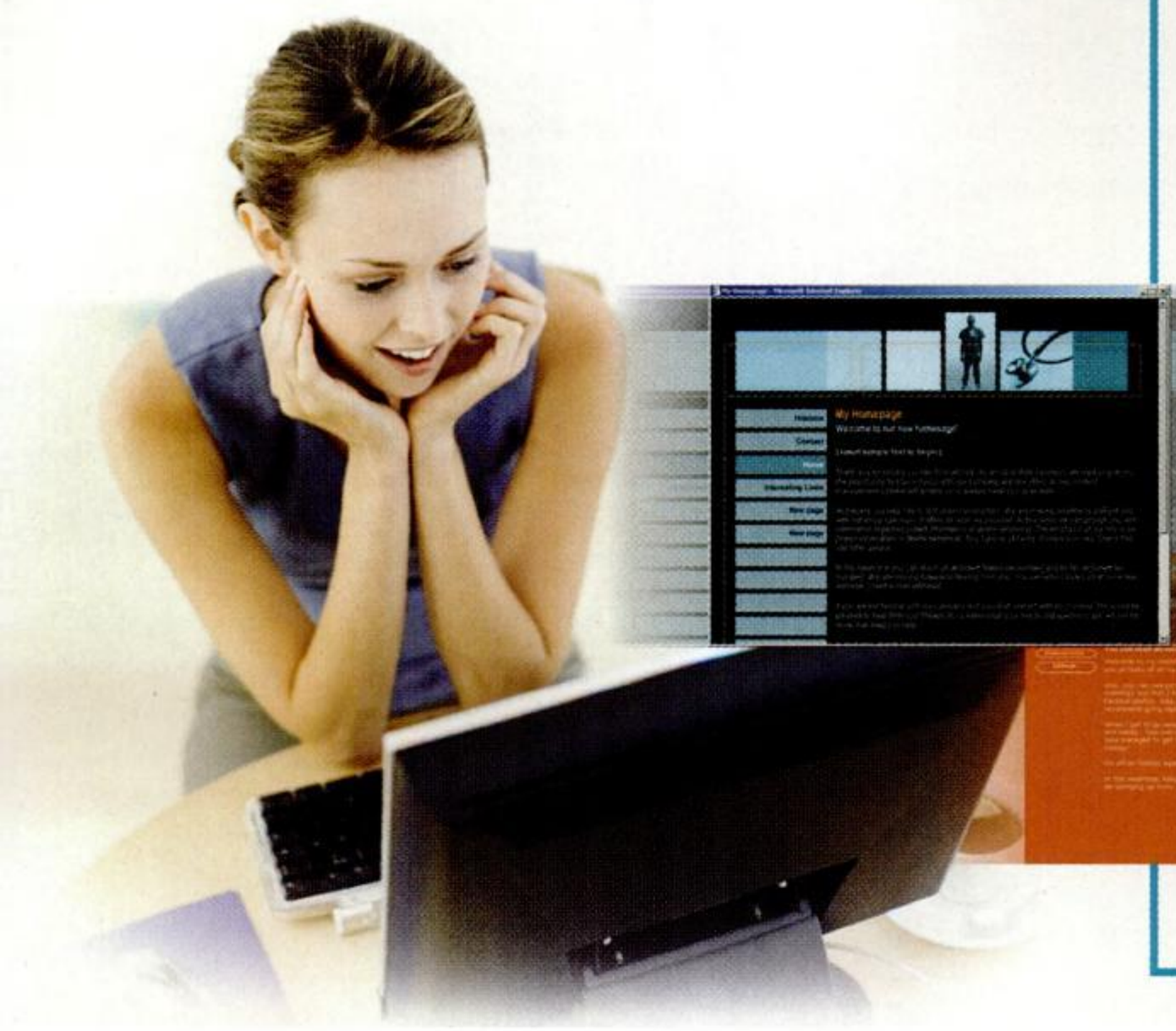
1&1

Copyrighted material

WEBSITE IN AN INSTANT

Create your ideal website in just 20 minutes.

With 1&1 Instant Website you can build a 12-page site quickly and easily using WebsiteCreator. Whether you're a beginner building your first site or an experienced user looking for a quick additional site with no programming hassles, 1&1 Instant Website offers the quickest, easiest, most feature-rich solution.



1&1 INSTANT WEBSITE

- Create your own website in just 20 minutes
- Ideal for beginners and experienced users alike
- WebsiteCreator – 12 pages included
- Choose from 120 customizable templates
- Online in just 5 easy steps
- Launches right from the 1&1 Control Panel – no software to install

$2.99 PER MONTH

1&1 makes it fast and easy to establish your presence online. Simply register your domain for just $5.99/year. Then sign up for 1&1 Instant Website and easily and affordably create a professional website in minutes – with no HTML knowledge needed!

.COM .NAME
.NET .ORG
.INFO .US

REGISTER DOMAINS FOR:
$5.99 PER YEAR

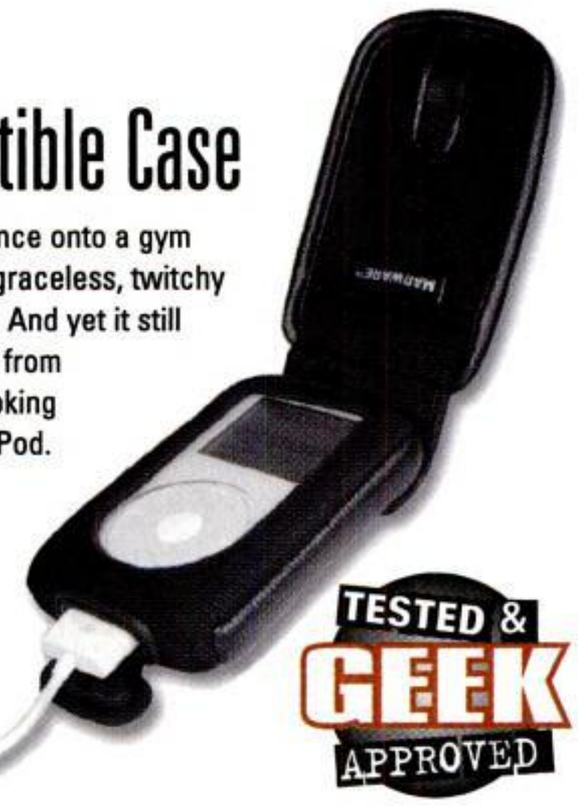
Member of united internet

1&1

FOR MORE DETAILS GO TO **WWW.1AND1.COM**

Copyrighted material

Marware SportSuit Convertible Case



Four drops from waist-high. Twice onto concrete. Once onto a gym carpet. Once on stairs. That's how many times one graceless, twitchy boob of a *Maximum PC* editor has dropped his iPod. And yet it still thrives, to which we credit the snug neoprene case from Marware pictured at right. You might find slicker-looking cases, but they won't look so great holding a dead iPod. We love the rubberized, sweat-proof grips on the side, the pitbull-like grip of the belt clip, and the rigid, detachable faceplate for rainy days. Now all we need is a tiny car seat and a little sign that says "iPod on Board."

$40, www.marware.com

Whither Thee BIOS?

The BIOS will be replaced within two years if Intel's EFI takes hold

Intel has formally laid out its plans to replace the BIOS in PCs by 2006. The giant chipmaker's alternative, called the extensible firmware interface (EFI), will be an open source program based on the C programming language that will introduce a set of API's between platforms and operating systems.

The basic input output system (BIOS) that's responsible for booting a PC has remained essentially unchanged since the original 8088 Intel CPU was introduced. Today's PC BIOS can't boot over complex networking topologies, executes in real mode, is not protected, and is limited to 1MB in size. BIOS code is also written in assembly, which slows down the process and makes it difficult to deal with complex algorithms for RAM and initializing busses.

EFI is expected to appear in 2005 with a full transition planned for 2006.

Best of the Best

As of November, 2004

November proved to be a ho-hum month with one exception—Logitech's Z-680 speakers finally got bumped from the top spot. Fortunately for Logitech, the system is being bumped by its own new Z-5500 Digital. The redesigned control pod, wall-mountable sats, huge sub, and higher-quality DACs for digital signals make it better than its sibling.

High-end videocard:
nVidia GeForce 6800 Ultra

Budget videocard:
ATI Radeon 9800

Do-everything videocard:
All-in-Wonder Radeon 9800 Pro

Soundcard:
Sound Blaster Audigy 2 ZS Platinum

Serial ATA hard drive:
Western Digital 740GD Raptor

Parallel ATA hard drive:
Maxtor DiamondMax 10

DVD burner:
Sony DRU-700A

LCD monitor:
Dell 2001FP

High-end CRT monitor:
NEC FE2111 SB

Socket 478 Pentium 4 motherboard: Abit IC7-MAX3

Socket 939 Athlon 64 motherboard: Asus A8V Deluxe

Athlon XP motherboard:
Asus A7N8X Deluxe Rev. 2.0

Portable MP3 player:
Apple iPod 40GB

Photo printer:
Canon i9900

Pocket PC PDA:
Dell Axim X30

Palm OS PDA:
Palm Tungsten C

7.1 speakers:
Creative Labs 7.1 Gigaworks S750

5.1 speakers:
Logitech Z-5500 Digital

4.1 speakers:
Logitech Z-560

2.1 speakers:
Klipsch GMX A-21

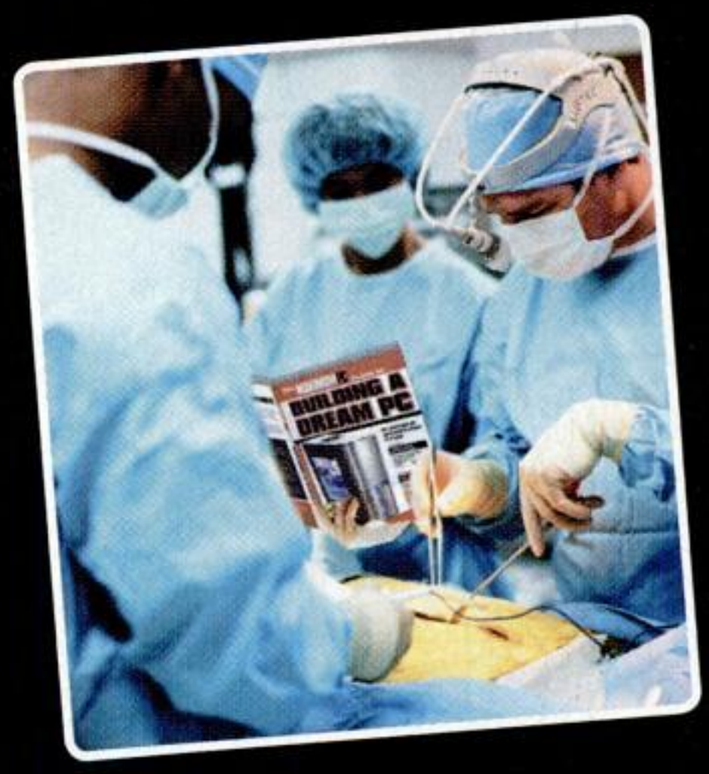
Analog headset:
Sennheiser PC-150

USB headset:
Plantronic DSP-500

Our current gaming favorites: *Rome: Total War, Doom 3, Painkiller, Planetside, City of Heroes, Desert Combat*

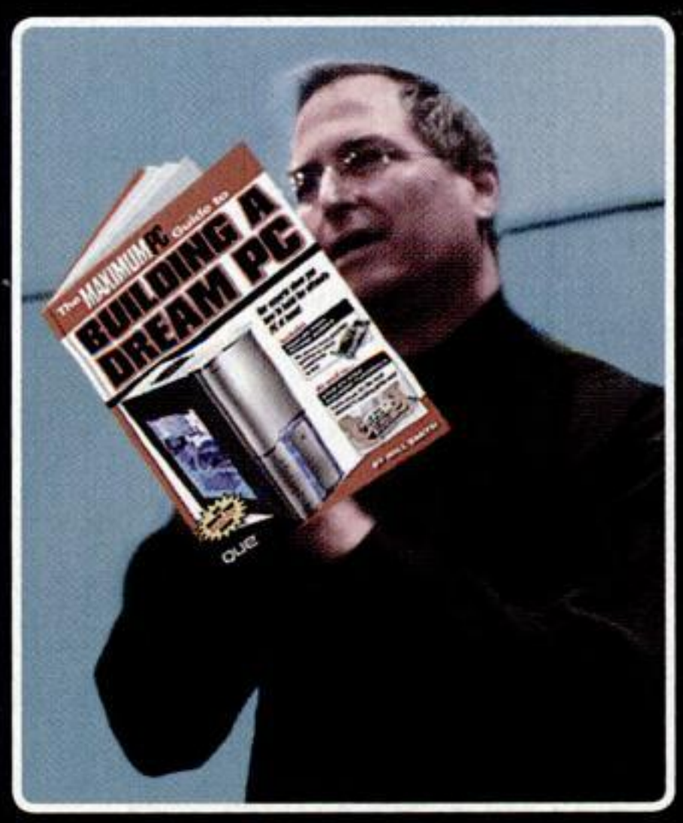
The Most Unusual Places

Thanks to the recent release of *Maximum PC* books, everyone is leaping on the PC building bandwagon. But don't let your passion for your custom rig get in the way of work!



"What do you mean you didn't know setting up RAID was that easy? We're performing open heart surgery here, Chad!"

"Roger that, Houston, I'm turning the videocar... I mean assembly TK421 left 90 degrees."



Steve Jobs: "In honor of the 21st anniversary of Macintosh, I've decided to finally build a real PC!"

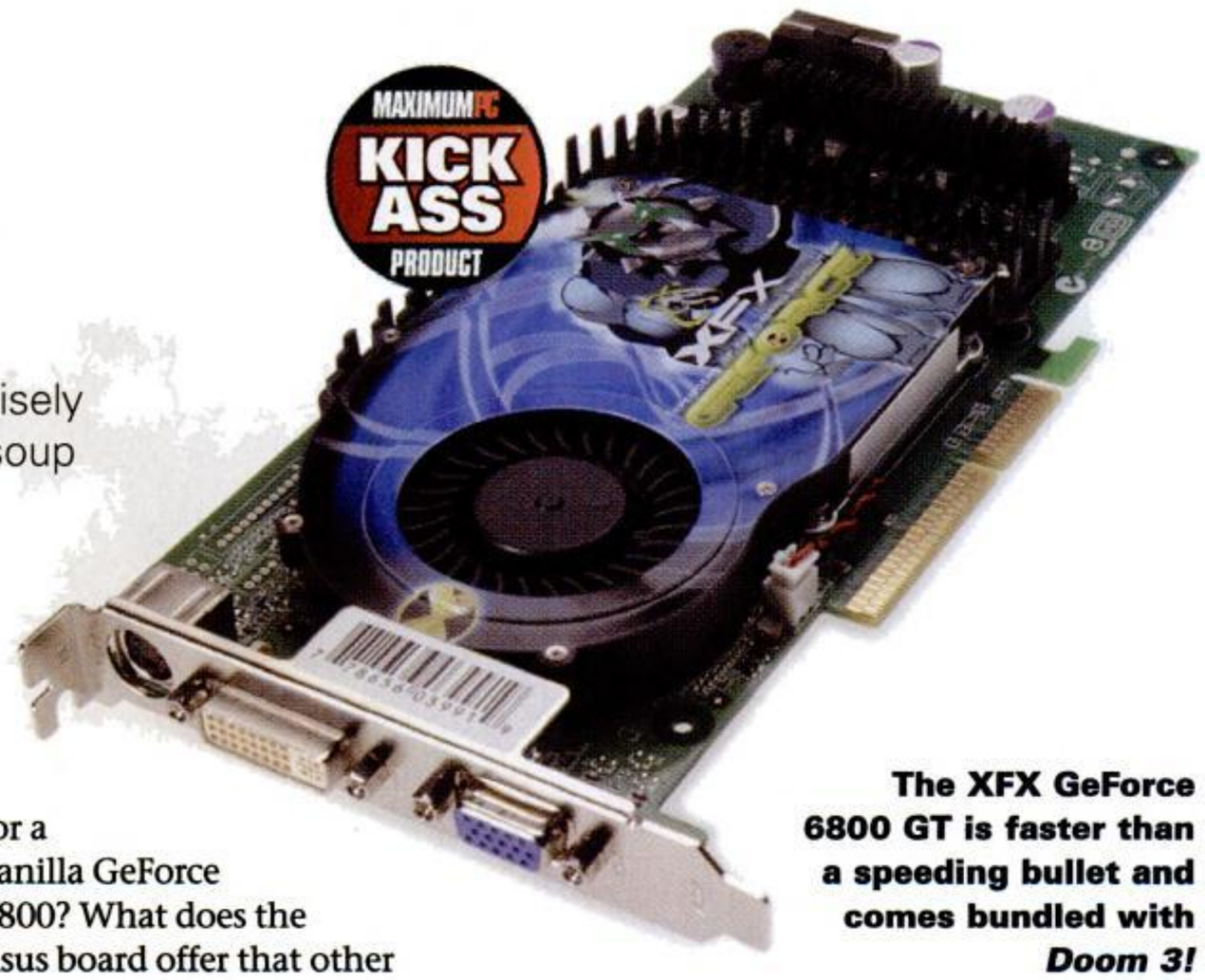
Copyrighted material

Videocard Vichyssoise

All GeForce 6800s are not created equal. Choose wisely or get stuck with a card that sucks more than cold soup

Sitting before you are two seemingly similar GeForce 6800 videocards. They both sport 256MB of GDDR3 memory, they both cost $400, and they both promise exceptional performance in 3D games. But one of these cards is not what it appears. Which will it be, the Asus V9999 Gamer Edition or the XFX GeForce 6800 GT?

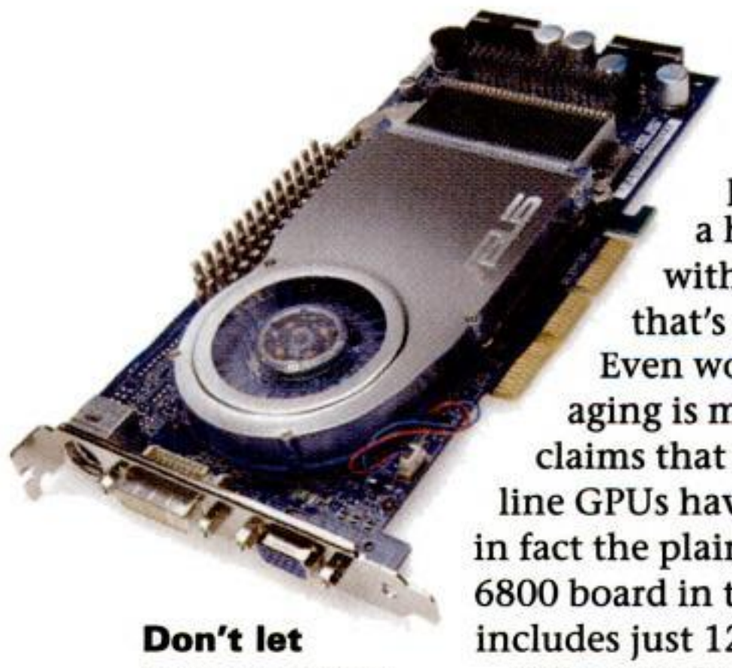
—WILL SMITH



The XFX GeForce 6800 GT is faster than a speeding bullet and comes bundled with *Doom 3!*

Asus V9999 Gamer Edition

Normally you can count on Asus to deliver quality, high-performance products, but the V9999 Gamer Edition really let us down. Instead of a top-class videocard with a nice bundle at a competitive price, we got a half-assed videocard with a crappy bundle that's clearly overpriced. Even worse, the card's packaging is misleading—Asus claims that the GeForce 6800-line GPUs have 16 pipelines when in fact the plain-vanilla GeForce 6800 board in the Asus box includes just 12. Boo! Hiss!



Don't let its packaging fool you, the Asus V9999 Gamer Edition is not the GeForce 6800 GT or Ultra that it purports to be; instead it's an overpriced, standard GeForce 6800.

When we fired up the V9999 for testing, our fears were confirmed. The board performed like a $300 videocard despite its $400 price tag. Our sinking feeling deepened when we began testing programmable shader games—like *Far Cry* and *Doom 3*. The V9999 Gamer was soundly trounced in every benchmark by the XFX GeForce 6800 GT.

OK, but suppose you're shopping for a vanilla GeForce 6800? What does the Asus board offer that other 6800 boards don't? Near as we can tell, all you get is a webcam and a fancy box with a handle. Handled boxes do not a gaming videocard make. We demand performance.

Asus V9999 Gamer Ed.

MAXIMUM PC VERDICT 5

+ HOT POCKETS

It didn't catch our system on fire.

– COLD SOUP

Misleading packaging. Buyer beware: Do your research so you don't get stuck with a 12-pipe board.

$400, www.asus.com

XFX GeForce 6800 GT

XFX is a relative newcomer to the graphics scene in the US, but the Chinese company has certainly done its homework. The XFX GeForce 6800 GT has just about everything we look for in a mid-range videocard.

XFX paired a stock GeForce 6800 GT GPU with 256MB of 256-bit GDDR3 memory. Like the 6800 GT board from BFG that we reviewed in August, it runs with a 370MHz core and 500MHz memory clock. Most importantly, like the other 6800 GT boards we've tested, 16 pipelines provide the maximum level of pixel lovin'.

When we plugged the XFX board into our test machine, its performance blew us away. It's damn near as fast as the more expensive GeForce 6800 Ultra, and uses only a single slot (GeForce 6800 Ultra boards require two slots to accommodate a larger cooling solution).

The card we tested includes the standard DVI, VGA, and S-Video outputs, and a dual-DVI option is available for about the same price. An extra-special touch we appreciate is that the XFX package also includes the full version of *Doom 3*, making it the first bundle we've seen in ages that's worth mentioning. We look forward to more kick-ass videocards from XFX in the future.

XFX GeForce 6800 GT

MAXIMUM PC VERDICT 9

+ THE TWILIGHT ZONE (1960s)

Nearly as fast as a 6800 Ultra, but $100 cheaper. Includes Doom 3 in the box!

– THE TWILIGHT ZONE (1980s)

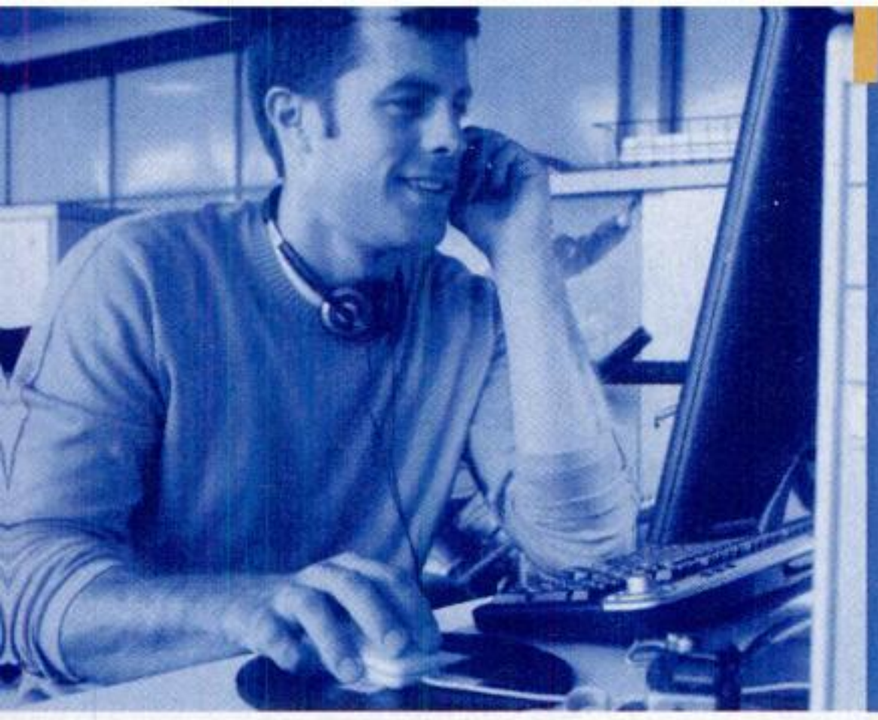
We'd prefer the flexibility of a dual-DVI card to a DVI/VGA hybrid.

$400, www.xfxgraphics.com

BENCHMARKS	Asus V9999 Gamer Edition	XFX GeForce 6800 GT
3DMark 2003 Overall (Default)	9,756	**10,998**
3DMark Game 2 (Default)	75.4 fps	**87.4 fps**
3DMark Game 4 (Default)	51.4 fps	**58.7 fps**
3DMark 2003 Overall (High Quality)	3,260	**3,748**
3DMark 2003 Game 2 (High Quality)	21.8 fps	**24.9 fps**
UT2003 Flyby	215 fps	**251.7 fps**
Far Cry 1.1	59.1 fps	**61.5 fps**
Halo	45.1 fps	**54.4 fps**
Doom 3 demo1	66.3 fps	**74.1 fps**

Best scores are bolded. All benchmarks are run at 1600x1200 except for Far Cry and Doom 3, which are run at 1280x1024, and the default 3DMark test, which is run at its default settings. High Quality 3DMark 2003 is run at 1600x1200 with 4x AA and 4x anisotropic filtering. There will be no more hippopotamus trivia.

Copyrighted material



Multi-tasking. Multi-talented.

Email, games, home movies.
The Intel® Pentium® 4 Processor with HT Technology can turn the ZT PRO into a multi-purpose powerhouse that handles all your PC favorites. And can provide an extra punch when doing two at once.

ZT recommends Microsoft® Windows® XP Media Center Edition

ZT PRO Gaming PC X6507

Intel® Pentium® 4 Processor 530 with HT Technology (3 GHz, 1MB L2 Cache, 800MHz)

Microsoft® Windows® XP Home Edition

Intel® D915GAVL(915G Chipset) Mainboard

512MB PC3200 Dual Channel DDR400

Seagate® 120GB Serial ATA/150 7200rpm (8MB Cache) Hard Drive

(Support RAID 0, 1, 0+1 Configuration)

7 in 1 Flash Media Reader

New" 16x DVD±RW & CD-RW Combo Drive

128MB ATI RADEON™ X300SE "PCI EXPRESS" w/TV-Out & DVI

Intel® High Definition Audio & 10/100 LAN

X-MEN MID Tower Chassis w/350watt Power Supply

Logitech® Internet Keyboard, Optical Wheel Mouse

Microsoft® Works 7.0

3-year Limited Warranty

$ 899

17" Flat Panel LCD Display (add:$ 359)
Logitech® Z-640 5.1 6 Pieces Speakers w/ Subwoofer (add $59.00)

ZT PRO Gaming PC X6508

Intel® Pentium® 4 Processor 540 with HT Technology (3.20 GHz, 1MB L2 Cache, 800MHz)

Microsoft® Windows® XP Home Edition

Intel® D915GAVL (915G Chipset) Mainboard

512MB PC3200 Dual Channel DDR400

Seagate® 160GB Serial ATA/150 7200rpm (8MB Cache) Hard Drive

(Support RAID 0, 1, 0+1 Configuration)

7 in 1 Flash Media Reader

New" 16x DVD±RW & CD-RW Combo Drive

256MB ATI RADEON™ X600 PRO "PCI EXPRESS" w/TV-Out & DVI

Intel® High Definition Audio & 10/100 LAN

Cooler Master MID Tower Chassis w/350watt Power Supply

Logitech® Internet Keyboard, Optical Wheel Mouse

Microsoft® Works 7.0

3-year Limited Warranty

$ 1,099

17" Flat Panel LCD Display (add:$ 359)
Logitech® Z-5300 THX Certified 5.1 6-Piece Speakers w/ Subwoofer (add $149.00)

ZT PRO Media Center X6509

Intel® Pentium® 4 Processor 540 with HT Technology (3.20 GHz, 1MB L2 Cache, 800MHz)

Microsoft® Windows® XP Media Center Edition 2005 w/ TV Tuner & Remote Control

Intel® D915P Chipset Mainboard

512MB PC3200 Dual Channel DDR400

Seagate® 160GB Serial ATA/150 7200rpm (8MB Cache) Hard Drive

8-channel High Definition Audio & S/PDIF Out

New" 16x DVD±RW & CD-RW Combo Drive

128MB ATI RADEON™ X600 XT "PCI EXPRESS" w/TV-Out & DVI

Dual Gigabit 10/100/10000 LAN

D.Vine 4 Aluminum Media Center Chassis w/450W Power Supply

Logitech® Cordless MX Duo Keyboard & Rechargeable Optical Wheel Mouse

Microsoft® Works 7.0

3-year Limited Warranty

$ 1,499

(Free Shipping)

17" Flat Panel LCD Display (add:$ 359)
Logitech® Z-5300 THX Certified 5.1 6-Piece Speakers w/ Subwoofer (add $149.00)

(984-7687) - YOUR SOLUTION FOR GAMING

866-ZTGROUP

http://www.ztgroup.com/go/maxpc1104

Please contact our system specialists for any customize systems via email to Shopper@ztgroup.com or call (866)984-7687

Special Discount for Education, Government & Corporate

Quality Assured • 3-year Limited Warranty
Lifetime Tech Support •

ZT GROUP

Purchaser is responsible for all freight costs on all return of returns of merchandise. Full credit will not be given for incomplete or damage returns. Absolutely no refunds for merchandise returned after 30 days. All prices and configurations are subject to change without notice and obligation. Opened software is non-refundable. All return have to be accompanied with an RMA number and must be in re-sellable condition including all original packaging. System's picture may include some equipment and/or accessories, which are not standard features. Not responsible for errors in typography and/or photography. All rights reserved. All brands and product names, trademarks or registered trademarks are property of their respective companies. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Copyrighted material

17-inch LCD Looksee

Do good things come in small packages?

Games look good on the L1730S, but they look even better on a bigger screen.

Ongoing advances in LCD technology have made LCD monitors ever more affordable, but if you see the value strictly in terms of size, you might not be getting the whole picture. Sure, we've espoused the virtues of big displays, but it's possible there are perks to sacrificing a little screen space. 17-inchers can offer features and technological refinement that either aren't available or are exponentially more costly in a larger LCD screen. That's the case with these LCD monitors, at least on paper. Is it enough to make us rethink our size bias?

—KATHERINE STEVENSON

Samsung SyncMaster 173MW

The 173MW is all about multifunctionality, as a glance at its generously appointed connector panel makes clear. VGA, DVI, S-video, composite, component, and coax are all present and accounted for. Add to that a remote control, support for HDTV, and picture-in-picture (PIP) capability, and you can imagine the monitor's myriad uses. The package is made complete with widescreen proportions and a built-in speaker that spans the width of the stylish metallic-finished chassis. In short, for the cost of a 19-inch LCD monitor you get a lot of extras. Is it worth the loss of screen real estate?

There's a time and place for the 173MW—like, say, as the display in your kitchen entertainment center.

First, we turned to *DisplayMate* (**www.displaymate.com**), and the 173MW executed the utility's various test screens without incident. The monitor proved capable, if not outstanding, at resolving dark grays against blacks and did a fine job with light grays against white. Colors looked true and graduations in tone were distinct. It's no wonder then that regular content looks good on the 173MW. The picture is crisp and vivid with excellent off-axis viewing.

Even so, we can't wholeheartedly endorse the 173MW. For all its multifunctionality, we felt confined. The monitor's widescreen makes a nice showcase for DVDs and games, but for computing purposes it's awkward. It's neither wide enough to display two web pages side by side at their native proportions, nor sufficiently high, thanks to the screen real estate that came off the top in order to extend the sides. What's more, unless you have HD, the full screen isn't suitable for TV—you'll probably want to shrink the image to Regular mode, and you can imagine how small that seems. PIP is a nice feature, but in this case, it's also another element competing for screen space. And novel though it is, the built-in speaker is no match for even a semi-decent 2.1 rig.

For about a hundred bucks more, you could have yourself a 19-inch screen, a TV tuner card, positional sound, and a bigger, better setup. The choice is clear in our minds.

Samsung 173MW

MAXIMUM PC VERDICT 6

+ M&Ms

It's nice to get so many connector options.

– MINI M&Ms

It just doesn't work for us as a "multifunction" display.

$800, www.samsungusa.com

LG Electronics L1730S

The L1730S distinguishes itself with a 12ms response time. That's the time it takes for a pixel to go from its "on" to "off" state, or in other words, to change color. A slow response time can lead to image imperfections like ghosting and streaking, particularly when displaying fast-motion content. Cost considerations relegate the very lowest response times to the smaller monitors, with 12ms being the lowest you'll currently find in a consumer product. Does the L1730S make a convincing case for this feature?

We were doubtful when we discovered that the L1730S has just a single analog input. Analog is fine as an option, but we prefer DVI as LCDs are natively digital. Still, for the most part, the L1730S was able to meet the challenges of *DisplayMate*. There was evidence of video noise (characteristic of analog signals) initially, but we were able to easily correct that using the monitors Phase control. We also experienced some issues on the dark end of the gray scales, where the L1730S seemed unable to resolve the subtle differences between dark grays and black. This latter discrepancy surprised us, because the L1730S's picture quality in general is so stunning. Whether working on our desktops or watching digital video, colors looked so distinct and vibrant that images seem to jump off the screen.

To put the 12ms response time to the test, we whipped out *Need for Speed Underground*, a fast-paced driving game that we used in our May 2004 issue's LCD gaming challenge, and the L1730S was able to hold its own with no noticeable visual aberrations. But in all honesty, we can't say the L1730S performed any better than the 20-inch Dell 2001FP LCD—the darling of our gaming challenge—which boasts a 16ms response time.

No, in the end, we're not convinced there's any compelling reason to give up size for "other stuff," provided cost and/or space considerations aren't your primary concerns.

LG L1730S

MAXIMUM PC VERDICT 8

+ MINI SHREDDED WHEAT

Beautiful, bright image quality and capable of gaming.

– SHREDDED WHEAT

Analog-only, issues resolving dark grays and black.

$500, http://us.lge.com

SPECS	Samsung 173MW	LG L1730S
Native resolution	1280 x 768	1280 x 1024
Pixel pitch	0.289mm	0.26mm
Interface	VGA, DVI	VGA

Copyrighted material

COOLER MASTER®

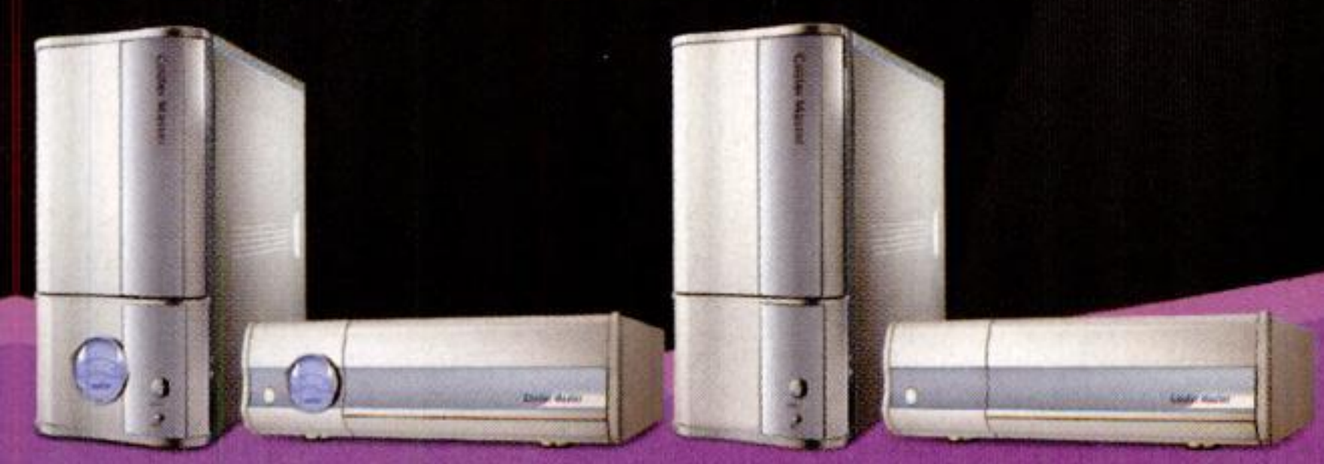
TECHNOLOGY OF EVOLUTION

The Perfect Curve

The "First" & "Original" by Cooler Master!

Cavalier

WAVE MASTER™



CAV-T01 CAV-T02 CAV-T03 CAV-T04

Escaping the boxy look of the past, the "Cavalier Series" of enclosures brings graceful lines and curves to your desk. The optional sound activated analog dial that dances to the music gives the Cavalier a nostalgic clock-case appeal. Cooler Master innovation and elegant design lets you express your own personal style.

TAC-T01-EK TAC-T01-E1C TAC-T01-EB

The Wave Master style has made a big splash with users and the media, winning numerous awards for style and function. The envy of other manufacturers, the Wave Master breaks above the traditional tower case with statuesque good looks and curve appeal. The original, only by Cooler Master.

To find your nearest Premium Distributor or Reseller, please go to the Where To Buy Section on Cooler Master website at: Http://www.coolermaster.com

Comtronic (905)881-3606

Supercom (905)415-1166

NorCal Distribution (408)416-0526

TigerDirect.com

PC Club

DIRECTRON.COM

Canada Computers www.canadacomputers.com

Fry's Electronics

Micro Center The Ultimate Computer Store

Precision Computers (305)593-5221

IS Technologies www.isitoday.com (610)436-5514

EPROM (909)944-9000

Lasertech (626)363-2645

FrozenCPU.com

newegg.com

Oxide

ZipZoomfly.com

Copyrighted material

DVD Writer Dustup

Memorex and Freecom present two external DVD burners

There's every reason in the world to have more than one PC, but it's pointless to duplicate some high-ticket items—like super-sexy dual-format, double-layer DVD burners—in both systems. External burners trot easily from one system to another, and you sacrifice no performance for the convenience. Even better, the external burners we're looking at this month offer the same cutting-edge speeds you'd get with *internal* drives!

—LOGAN DECKER

Writes to:	
DVD+R DL	2.4x
DVD+R	8x
DVD-R	8x
CD-R	40x
Rewrites to:	
DVD+RW	4x
DVD-RW	4x
CD-RW	16x
Reads:	
DVD-ROM	12x
CD-ROM	40x

Freecom combines calm design with solid performance. Interestingly, Roxio reported this drive's burn rate to be 40x, while the box rates it at 32x.

Freecom Classic DVD Dual Format Double Layer Burner

We don't know what the "Classic" refers to, as there is no Freecom Nü Burner that we know of, but with its slate black color and stackable design, the nearly foot-long case of this dual-format, double-layer burner looks sophisticated and modest. The performance of the drive is also sophisticated and modest, with results that reflect the latest speeds in the various formats without achieving benchmark-busting results in any single category

The "Classic" stands pretty much shoulder to shoulder with Sony's DRU-700A, at 8:50 (min:sec) to burn 4.25GB to a DVD+R and 45:12 to burn 8.5GB to a 2.4x DVD+R DL (double-layer) disc. While the CPU utilization gets pretty high, the same can be said of the Memorex and all other external drives that don't benefit from the express lanes of IDE and SATA connections. (Make sure you avoid multitasking when burning at high speeds on external burners). Although the box says that the Freecom burner writes to CD-R at 32x, Roxio reported the writing speed to be 40x, resulting in a time of 3:08. You'll not hear any complaints from us.

THE BUNDLE

Roxio Easy CD Creator 6
Roxio DVDMax 2.0

Freecom Classic DVD

MAXIMUM PC VERDICT 8

ZIPPO

Inexpensive for an external drive, and no performance slouch.

HIPPO

Fails to excel in any one category

$200, www.freecom.com

BENCHMARKS	DVD	CD
Average data transfer (MB/sec)	8.5	4.6
Random/full-stroke seek (ms)	110/204	99/185
Audio extraction (min:sec)	–	2:41
Data DVD/CD burn (min:sec)	8:50 (DVD+R)	3:08
CPU utilization	19% (2x)	10% (8x)

The data CD burn, DVD burn, and DVD double layer tests use the bundled applications to create a 700GB CD-R, 4.25GB DVD, and 8.5GB double layer DVD, respectively. The audio-extraction test uses a commercially stamped 74 minute audio CD. All tests were performed using Verbatim media, except where noted.

Big, unwieldy, and fast—Memorex brings you the sports utility DVD burner. This baby set numerous lab records during testing.

Writes to:	
DVD+R DL	2.4x
DVD+R	16x
DVD-R	8x
CD-R	48x
Rewrites to:	
DVD+RW	4x
DVD-RW	4x
CD-RW	24x
Reads:	
DVD-ROM	16x
CD-ROM	48x

THE BUNDLE

Ahead Nero Express 6
Ahead Vision Express 2
Ahead Nero BackItUp
Ahead Nero Showtime
Ahead Nero Recode 2

Memorex 16x

MAXIMUM PC VERDICT 9

BIC

Cutting-edge internal drive speeds in an external package.

HICK

Looks dreadful.

$230, www.memorex.com

BENCHMARKS	DVD	CD
Average data transfer (MB/sec)	8.6	5.5
Random/full-stroke seek (ms)	99/185	124/238
Audio extraction (min:sec)	–	2:23
Data DVD/CD burn (min:sec)	7:28 (DVD+R)	3:03
CPU utilization	18% (2x)	10% (8x)

The data CD burn, DVD burn, and DVD double layer tests use the bundled applications to create a 700GB CD-R, 4.25GB DVD, and 8.5GB double layer DVD, respectively. The audio-extraction test uses a commercially stamped 74 minute audio CD. All tests were performed using Verbatim media, except where noted.

Memorex 16x Dual Format Double Layer External

Before objective assessment of this drive can begin, we have to get this off our collective chests: What is up with this drive's enclosure? It's absolutely huge, and shaped like, well, like nothing else. External drives are big enough as it is, but Memorex makes this worse by bowing out the case on both sides so you can't prop the drive on its side—and you certainly can't operate it this way. The top of the drive is bowed out as well—it looks like there's a nasty case of botulism going on inside—and as a result, you can't stack anything on top.

It's big, it's ugly... but it's fast. Holy *moly* is it fast. In fact, the Memorex DVD burner finally puts to bed the notion that buying an external drive means settling for a notch or two below top-shelf performance. We burned 8.5GB to a 2.4x DVD+R double-layer disc in a record-breaking 42:47! Not too long ago, seven and a half minutes was an impressive result in our 700MB CD-R burn test; today the Memorex burns 4.7GB to 16x DVD+R media in that same time. Memorex also breaks new ground for external DVD burners by writing 700MB of data to a CD-R in just 3:03, and taking a mere 2:23 to rip the contents of a 74-minute plus audio CD.

Although the exterior will make you want to hide this drive beneath a blanket, you'll find both USB 2.0 and two FireWire ports in the rump, as well as RCA audio out jacks and an on/off switch.

Memorex continues to solidify its name as one of the top names in optical drives today. If you're brawny enough to lift it and don't mind the strange exterior, this is as fast as external DVD burners get.

Copyrighted material

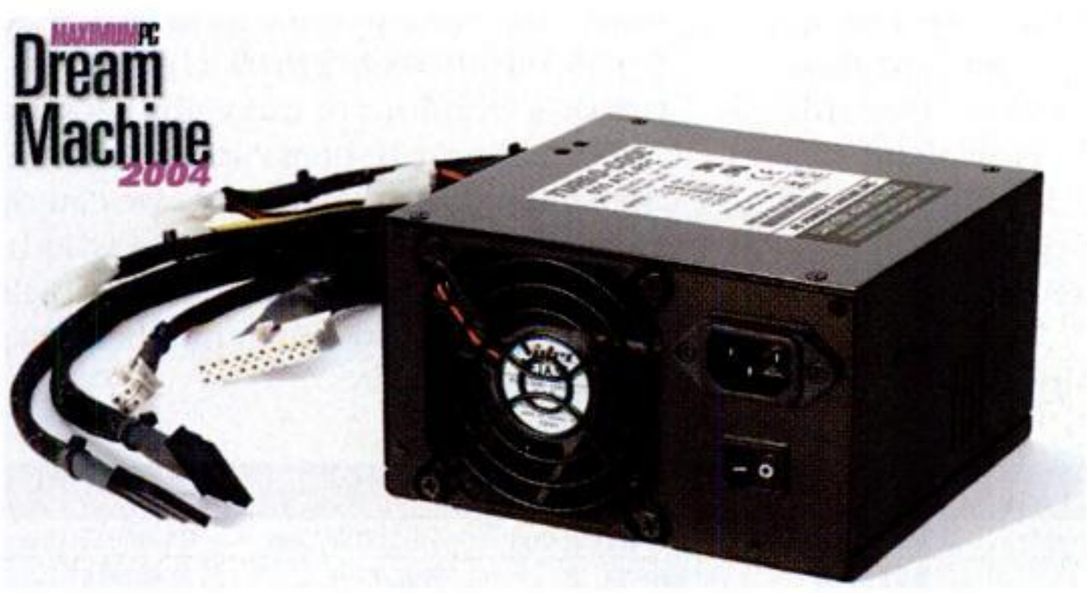
GETS DOWN

LETS YOU DOWN

Turbo-Cool® 510 Power Supply

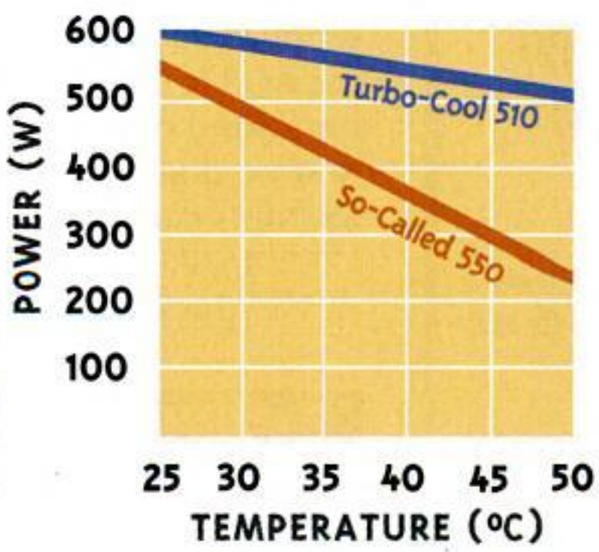
So-Called "550" Power Supply

Power @ 25°C:	**600W**	**550W**	Rating requires room temp. < 55°F
Power @ 40°C:	**550W**	**366W**	40°C is a typical power supply temp.
Power @ 50°C:	**510W**	**244W**	50°C is the spec for a commercial PC
+12V Output:	**34A/38A**	**24A**	**50% more power for CPUs and drives**
Regulation:	**1%**	**5%**	**Turbo-Cool's voltages are 5X tighter**
Ripple:	**10mv**	**50mv**	**Turbo-Cool's outputs are 5X cleaner**
Max. Cooling:	**44 cfm**	**40 cfm**	Tests show "550's" 2nd fan is ineffective
Active PFC:	**Yes**	**No**	Continuous range line conditioning
Voltage Pots:	**Yes**	**No**	Adjustments for system fine tuning
Intel Listed:	**Yes**	**No**	Turbo-Cool 510 tops Intel's ATX12V list
Warranty:	**5-Years**	**1-Year**	Reliability and longevity indicator



- **Check Our Website for *Ten* 510 Reviews!**
- **New Turbo-Cool® 510 PCI Express Available!**

Don't be Misled by Wattage Claims!



*Even though the ambient temp. in a power supply is at least 40°C (104°F), most manufacturers unrealistically assume 25°C (77°F) in order to exaggerate their wattage claims. Since the proper full-load rating is 15°C higher, these power supplies produce **33% less power than their advertised ratings** as shown on the derating chart.*

Turbo-Cool 510 operating temperature spec: *full load @ 50°C.*
So-Called 550 manufacturer's spec: *full load @ 25°C, decrease to no load @ 70°C.*

PC POWER & COOLING, INC.®

High-Performance Computer Power Supplies Since 1985

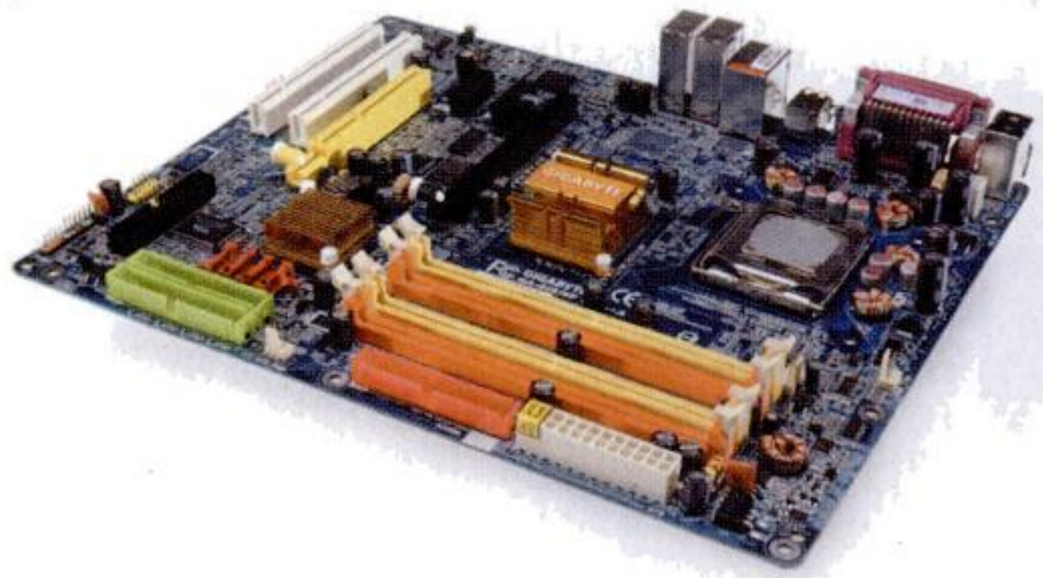
www.pcpowercooling.com • 5995 Avenida Encinas, Carlsbad, CA 92008 • (760) 931-5700 • (800) 722-6555

Complete specifications and pricing available on website. Turbo-Cool and PC Power & Cooling are registered trademarks of PC Power & Cooling, Inc. ©2004

Copyrighted material

Mobo Melee

Two Socket 775 motherboards vie for our affection in two completely different ways



You're seeing right—this motherboard has ports for PCI Express *and* AGP graphics (well, sort of).

This month we look at Abit's AA8 DuraMax motherboard and Gigabyte's GA-8I915P Duo (Pro)-A. One asks you to take a giant leap off a cliff into the new world of PCI Express and DDR2, while the other firmly straddles the old and new worlds.

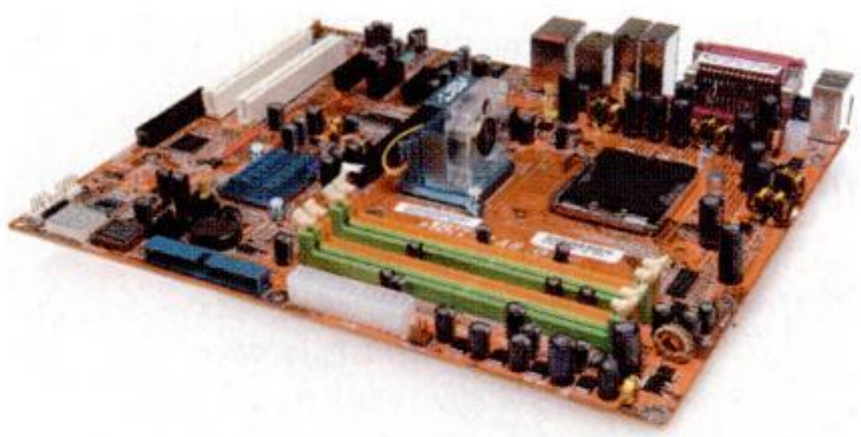
—GORDON MAH UNG

Abit AA8 DuraMax

Outfitted with Intel's new 925X chipset, Abit's AA8 DuraMax mobo embraces PCI Express and DDR2 with wide-open arms.

The board features a single x16 PCI-E slot for graphics, and no fewer than three x1 slots for PCI-E add-in boards. The only problem, of course, is that PCI Express cards are impossible to find. This leaves the mobo with room for just two PCI cards. If you have a TV tuner, SCSI card, and sound-card, you're going to have to vote one off the DuraMax island.

PCI slots aren't the only thing Abit has eschewed on the DuraMax. While the board gives you four SATA ports, you get just a single parallel ATA connector. This means that if you have two optical drives and a parallel ATA hard drive, another one of your precious components will have to leave the tribe.



The AA8 waves goodbye to AGP and DDR, but we're disappointed with its performance.

Abit AA8 DuraMax

MAXIMUM PC VERDICT 6

+ GINGER

Placement of PCI Express x1 slots next to the x16 slot gives breathing room to graphics cards; the LED POST readout is nifty.

– MARY ANN

Needs more parallel ATA connectors.

$175, www.abit-usa.com

On the positive side, this mobo includes four USB ports, FireWire A, Gigabit Ethernet, and two optical ports. Audio is powered by a RealTek ALC880, which supports 8-channel 24-bit/96kHz audio. Abit also uses expensive and more reliable Japanese-made Rubycon capacitors in the AA8 DuraMax, which is wise considering Abit was one of several vendors plagued by bad capacitors a few years ago.

Our main problem with the AA8 DuraMax isn't the forward thinking—it's the lackluster performance. For our tests, we used a 3.4GHz Pentium 4 in LGA775, a GeForce 6800 Ultra card, and 300GB Maxtor SATA drive, and were disappointed with the results. Astonishingly, Gigabyte's GA-8I915P Duo (Pro)-A mobo, with its supposedly slower 915P chipset (reviewed below), ran just as fast, if not faster, in half of our benchmark tests.

Gigabyte GA-8I915P Duo (Pro)-A

Just call Gigabyte's Duo mobo "the waffler." Are you wondering whether to do DDR or DDR2? Are you flip-flopping between AGP and PCI-Express graphics? The Duo does it all.

If this sounds like the perfect motherboard for your gradual migration from old to new gear, know that all is not perfect here. First, while it's absolutely amazing that Gigabyte has created a board that supports such a multitude of standards, the AGP is not actually native, but rather some kind of bridge that plugs into PCI. And we don't mean PCI Express with 250MB/s data rates. We mean old-school 133MB/s PCI.

We quickly determined that it would

Gigabyte GA-8I915P Duo

MAXIMUM PC VERDICT 7

+ COCONUTS

AGP and PCI-E. DDR and DDR2. Need we say more?

– MONKEYS

AGP performance is horrible and ATX12V plug is oriented poorly.

$145, http://tw.gigabyte.com

be a crime against humanity to install a high-end card into this faux AGP slot. It doesn't appear that slower cards, such as a GeForce 4 MX or Radeon 9600, are likely to suffer the same penalty. Like Abit's AA8 DuraMax, the Duo provides just two PCI slots.

On the memory front, we outfitted the board with Corsair Micro DDR and then DDR2 modules to see if there was any performance difference. Sadly, we found none, which indicates that migrating to DDR2/533 from DDR400 is pointless in the Duo. We're not taking this as a referendum against DDR2, however, because the Duo board wouldn't allow us to optimize RAM timing settings in the BIOS.

Interestingly, Intel says the 925X is faster than the 915P, but in this showdown, the 915P doesn't seem slower at all. Check out the benchmark chart below—the Duo won four of our eight benchmark tests. While we're pretty impressed that the Duo works as advertised, we can only recommend this board to those who have a need for such flexibility—and also clearly understand how much of a handicap the AGP slot creates.

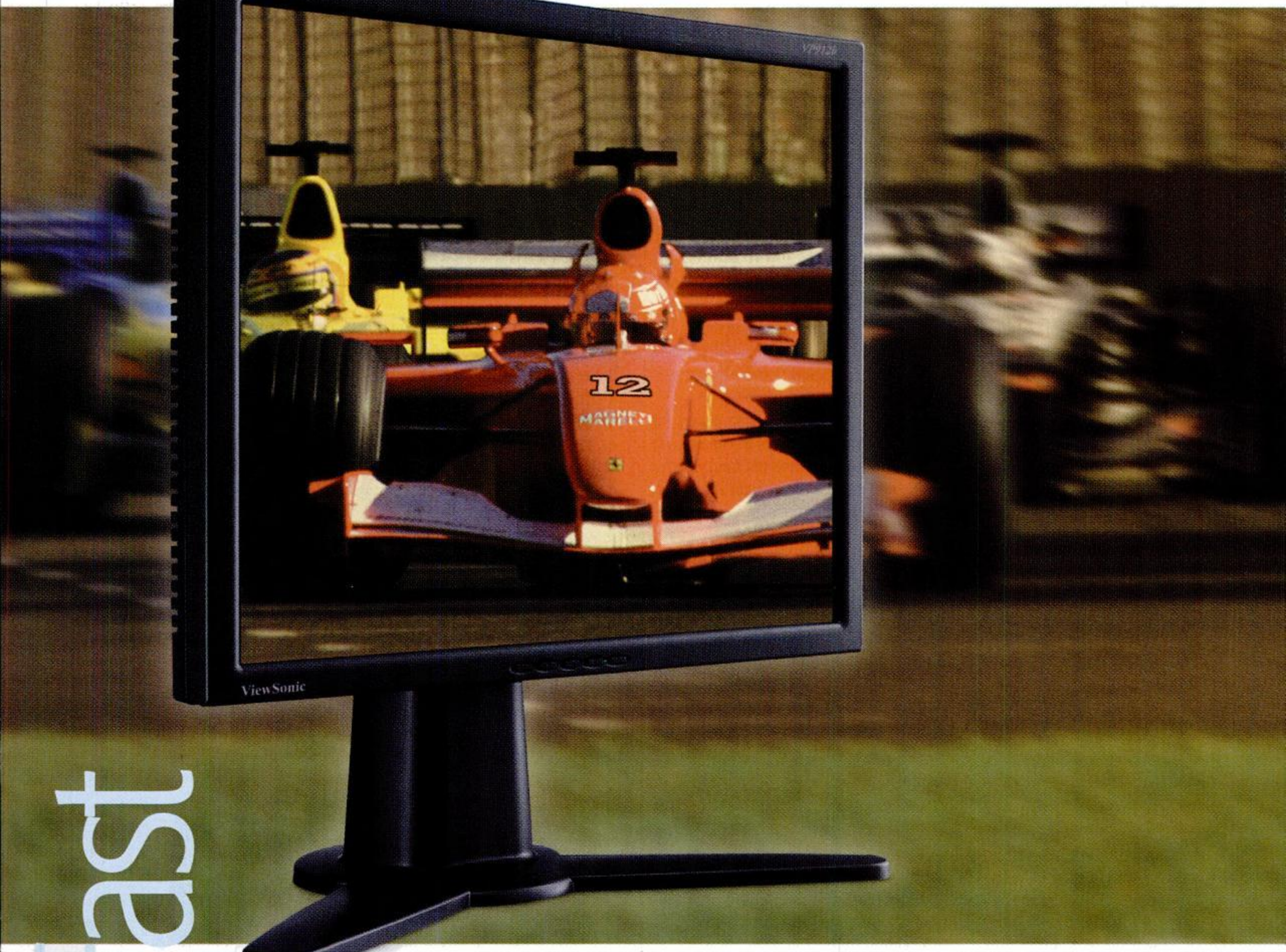
BENCHMARKS

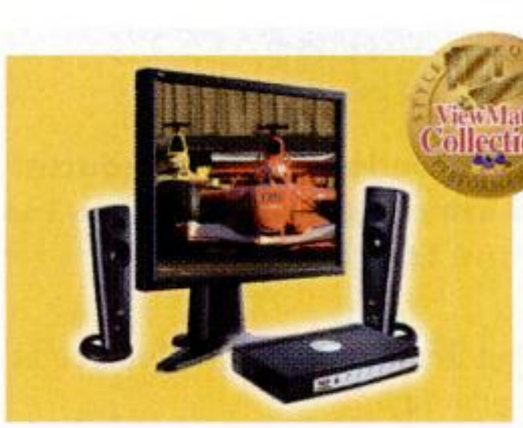
	AA8 DuraMax	GA-8I915P Duo	GA-8I915P Duo	GA-8I915P Duo	GA-8I915P Duo
comp	default	AGP/DDR	AGP/DDR2	PCIE/DDR	PCIE/DDR2
3DMark 2001 SE	20349	13548	13622	22793	22779
3DMark 2003	12363	8137	8140	12716	12713
3DM CPU	906	173	174	1003	1004
Quake III	522	130	130	460	461
AquaMark 3	67173	29434	29492	67261	67293
UT2003 Fly-by	279.42	225	225	276	274
Doom 3 10x7	88	66.9	67.0	87.1	87.3
Sandra RAM	4708	4547	4692	4574	4690

All tests were conducted with a 3.4GHz Pentium 4EE, 1GB of Corsair Micro DDR/DDR2, a 300GB Maxtor SATA drive, a GeForce 6800 Ultra in PCI-E, and AGP with 61.77 drivers.

Copyrighted material

Licensed to Speed





Add personal TV to this versatile desktop with ViewMate® Desktop Collection accessories.

ViewSonic's new super bright VP912b 19" LCD with ultra-fast video response wins every time. Bring next generation image quality to your home or office. ClearMotiv™ Video Technology, 12 millisecond response and a high-brightness 400-nit (typ.) panel deliver startling clarity for today's video/web conferencing, gaming, e-learning, and digital video applications with virtually no ghosting. Space saving thin profile, stylish design and incredible video quality – you'll get it all from ViewSonic's growing line of fast-response displays. With innovative products designed to meet your needs, ViewSonic continues to be the choice of professionals as the #1 display brand in the US,* earning more than 1000 awards worldwide.

Find out **Where to Buy** at **ViewSonic.com** or call **800-888-8583**

ViewSonic®

*See ViewSonic.com for detailed awards list. Leading stand-alone, branded monitor by sales (CRT and LCDs combined; iSuppli/Stanford Resources Monitrak® and Flat Panel Monitrak,® 2Q04 report). Specifications, availability and pricing subject to change without notice. Copyright © 2004 ViewSonic Corporation. All rights reserved. [12110-00E 08/04]

Copyrighted material

Creative Zen Touch

A step up from the Nomad NX, but still several steps below the iPod

The Zen Touch's battery life is impressive—we're talking 20-plus hours of continuous play!

Let's see... hard drive-based MP3 player... sleek white fascia... touch-sensitive controller. Well, there's no sense in beating around the bush—the Zen Touch is Creative's answer to the iconic iPod. And while it's unlikely anyone is going to dump their iPod in favor of the Zen Touch's more awkward design, it does best Apple where it's the most vulnerable, battery life.

Even after a week of frequent use, the battery still hadn't begun to wheeze (a battery drain test at approximately 75 percent volume yielded more than 21 hours of continuous play). How did Creative do it? Once you pick up the Zen Touch, the answer is obvious. The ZT is about three-eighths of an inch (roughly the thickness of a CD jewel case) thicker and considerably heavier than the fourth-generation iPod of the same 20GB capacity.

In the center of the unit is a narrow, indented touch-sensitive strip used for scrolling and browsing tracks. We'll just come right out and say it: The strip is no match for the iPod's wheel. It's twitchy, and selecting the right track in a list often meant we had to "scrub" the strip up and down until the right song was highlighted. And sometimes just lifting our big fat thumb off the strip caused the highlighting to jump up or down a few tracks. That's annoying.

Creative serves up two ways to access its player from your PC. There's the classic *Creative MediaSource*—track manager, music ripper, and audio player rolled into a single app. But for simple player management, *Nomad Explorer* integrates itself into Windows Explorer for convenient access and playlist fiddling. Unfortunately, Creative still refuses to allow its MP3 players to show up as removable hard drives in Windows Explorer. This prevents the Zen Touch from serving as a tote bag for your data files, because you need the *Nomad Explorer* software to access the drive. This is fine if you only want to transfer data files between your PCs at work and home, for example, but a serious limitation if you need more freedom than that. And where the hell is the support for OGG tracks?

The battery life is extraordinary and the Zen Touch sounds as good as any MP3 player, including the iPod. But for a mere 30 bucks more, you can have the svelte, luscious iPod *and* easier access to your data files. Just make sure you keep your charger handy.

—LOGAN DECKER

MAXIMUM PC VERDICT 7

+ ZEN

Fantastic battery life. Integration with Explorer makes song management easy.

– PHEN-FEN

Fumbly design. Doesn't show up as a removable hard drive.

$270, www.creative.com

Logitech Z-5500 Digital

These speakers are our new favorites—and for good reason

Logitech completely redesigned the control pod for the Z-5500—options are now much easier to read thanks to a new black-on-white LCD screen.

Because Logitech's Z-680 5.1 speaker set has long been the love of Labville, and is the only speaker system to receive a perfect 10 verdict in the past two years or so, we wondered what Logitech could possibly do to improve it. Now we know. In fact, by comparison, the Z-5500 rig is so good, it reveals flaws in the Z-680 system we hadn't previously noticed.

Essentially, this setup delivers the exact same hair-raising, soul-crushing power as the Z-680, but is much easier to live with thanks to a dramatically redesigned control pod and a few other amenities. The controls look more elegant and are now one thousand times easier to read, thanks to added contrast in the display. Additionally, the wheel lag that made dialing up the desired volume level in the Z-680 so frustrating has thankfully been 86'd in favor of a knob that offers a much faster response time. The satellites have also been redesigned, and are now less pod-like and more sleek, and feature a swiveling base (a la the Z-5300) that allows for easy wall-mounting. The speaker wires are now attached to the satellites, which is unfortunate because the Z-680 set let you use any length and type of speaker wire you wanted. On the other hand, the 25-foot Logitech wires should be more than sufficient for most folks. If not, you're up a creek.

Technologically, Logitech is sticking with its single-driver phase plug design, and we're not complaining. During testing the satellites delivered the same killer treble and midrange we experienced with the Z-680, making the two speaker systems virtually indistinguishable in that respect.

The subwoofer, however, has grown to such a gargantuan size that Lab technicians were heard muttering a respectful "holy sh--" when it was removed from the box, followed by awe-filled silence when its full girth was fully revealed. We had zero complaints about the previous set's 8-inch driver, but the new all-black 10-inch unit is downright incredible. It's not a night-and-day difference from the older unit, but it's noticeably deeper at higher volume levels.

Finally, some Z-680 sets emitted an annoying hiss from the satellites, but thankfully the Z-5500 Digital offers no hiss, only sonic bliss.

—JOSH NOREM

MAXIMUM PC VERDICT 10

+ PRINGLES

Easy-to-read controls, even more powerful sub, all-around awesome.

– LAY'S STAX

Speaker wire is attached to speakers.

$400, www.logitech.com

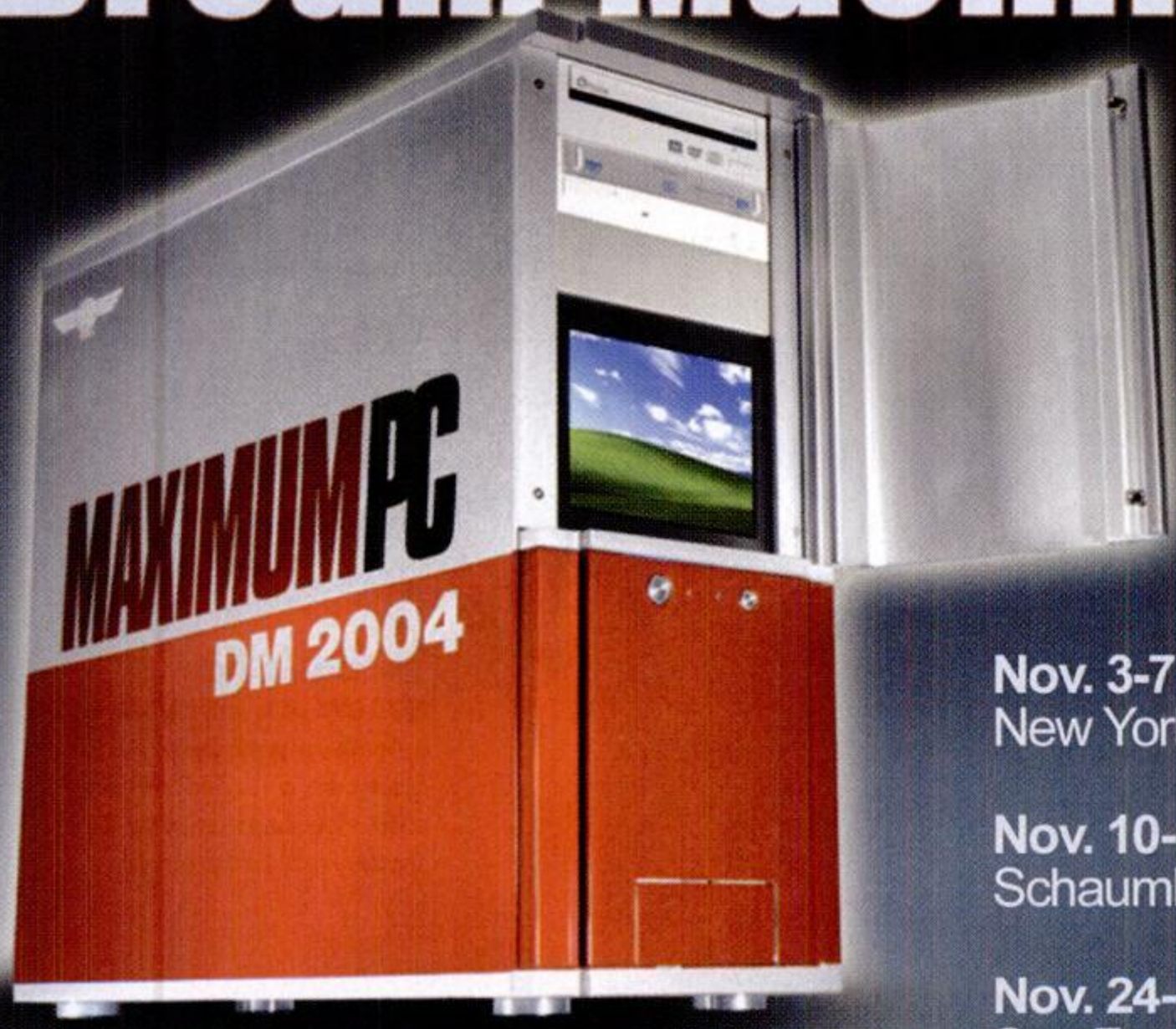
Copyrighted material

Ripped from the Pages of Maximum PC

For Your Gawking and General Amazement

THE 2005 Maximum PC Dream Machine Tour

PRESENTED BY ATi



Nov. 3-7, 2004: Loews Cineplex Lincoln Square
New York, NY

Nov. 10-14, 2004: Loews Cineplex
Schaumburg, IL

Nov. 24-Dec. 24, 2004: Sony Metreon
San Francisco, CA

Mar. 11-20, 2005: South by Southwest
Austin, TX

For more information visit
www.maximumpc.com

SPONSORED BY:

MEDAL OF HONOR PACIFIC ASSAULT · newegg.com · The Lord of the Rings: The Battle for Middle-earth · crucial TECHNOLOGY · Star Wars Battlefront · que · Star Wars Republic Commando

Copyrighted material

Swans M-200

These fancy-pants speakers are great for music, but bad for games

The M-200's walnut finish will certainly add a touch of elegance to your desktop, if you have the room for them. Each speaker measures 15 inches in height.

Swans has recently earned a name for itself, thanks to the numerous hardware web sites that have been touting the company's speakers as the best. If you've never heard of the company, get this: Its high-end 2.2 speakers cost $68,000—that should give you an idea of the company's profile. Enticed, we contacted Swans via e-mail, and bada-bing, bada-boom, received a set of the company's low-end 2.0 multimedia speakers a few days later.

Initial testing immediately revealed one thing: You know how drug dogs can sniff out cocaine from 10 yards away? That's how these speakers are with bad recordings. MP3s encoded at a 128kbps bitrate sounded like crap—and these were the same recordings that sounded perfectly acceptable when played through traditional "gaming" speakers from Logitech and Klipsch. We could even detect whether WAV files ripped from CD were originally recorded on analog equipment or purely digital—these speakers are that crystal clear in the treble and midrange. Listening to flamenco guitars with these speakers, we could literally feel the twang of the strings and hear every nuance of the recording. It made us feel like we were standing right next to the guitar player himself.

High- and midrange response is phenomenal, but bass response is lacking. This isn't unusual for a 2.0 system, as there's no subwoofer to speak of. Instead, each of the M-200's speakers uses a five-inch midrange driver that reportedly dives down to 50Hz, but in our testing experience the speakers were unable to deliver the rich, deep bass tones we've come to expect from today's gaming speakers. For example, in *Doom 3* the machine gun delivered punchy, rapid-fire tones we could feel, but when an enemy teleported into a room—an effect accompanied by a deep bass tone—the overtaxed speaks emitted just static. The weak bass response was also apparent in our 20Hz-to-22kHz frequency sweep, with the speakers remaining largely silent in the beginning and end of the test file—a clear sign they're unable to produce extremely deep frequencies.

In the end, the M-200 set is a mixed bag. While it takes up a lot of desktop real estate, it's by far the best sounding speaker system we've ever heard in terms of treble and midrange. But if you're a gamer or lover of bass-heavy music, we recommend a system with a subwoofer for maximum thumpage.

—JOSH NOREM

MAXIMUM PC VERDICT 7

+ BEAUTIFUL SWAN
Incredible fidelity and exquisite exterior.

– UGLY DUCKLING
Very pricey and the bass response is lacking.

$400, www.swanspeaker.com

D-Link Wireless Internet Camera

A webcam with pan, tilt, and zoom? Indubitably!

The D-Link DCS-5300W is a completely wireless webcam—and you can even remotely aim the camera via your web browser!

Basic webcam technology has been around since the dawn of the Internet. But, from their humble beginnings in the video-conferencing world to their rapid adoption by the porn industry, we haven't seen too many leaps forward in functionality. So a remote-controlled webcam that can pan, tilt, and zoom really puts the jiggle in our Jell-O.

The D-Link DCS-5300W connects over your network—either Ethernet or 802.11b—and can FTP images to a web site, copy them to a network share, or even stream audio and video live over the Internet to any other computer in the world. Because the camera is mounted on a motorized base, you can turn it to point at anything you like. The only problem is that in order to see the video, you have to use *Internet Explorer*—users of *Firefox*, *Opera*, *Safari*, and all other web browsers are outta luck, which is bunk.

Configuring the DCS-5300W is a snap. Simply plug the camera into your wired LAN, install the provided software on a Windows machine on the same network, and use the configuration wizard to set up the camera for your Wi-Fi network. It's important to note that the 5300W is an 802.11b camera. If you connect it to an 802.11g network, it will drag performance on your entire LAN down. However, you can buy the 802.11g version for only about $30 more.

We were pleasantly surprised by the quality of the still images and videos the 5300W creates. While it's inferior to even the weakest camcorder or still digital camera, it's far superior to most webcams we've reviewed before. And being able to aim the camera while you watch remotely is undeniably cool and a huge advantage over the competition.

Unfortunately all this coolness comes at a hefty price. We can't imagine shelling out more than four hundred bucks just to see what our cat does while we're away at work. But if you've been considering buying a home-security camera or setting up a front door cam, the DCS-5300W is a much cheaper alternative than having a hard-wired camera professionally installed.

In the end, several small annoyances conspire to rob this cam of Kick Ass status.

—WILL SMITH

MAXIMUM PC VERDICT 8

+ SILLY PUTTY
Place it anywhere you have Wi-Fi, then aim it remotely. Image quality is great for a webcam.

– PLUMBING PUTTY
A tad expensive, and video viewing is Internet Explorer-only. We'll wait for the 802.11g model.

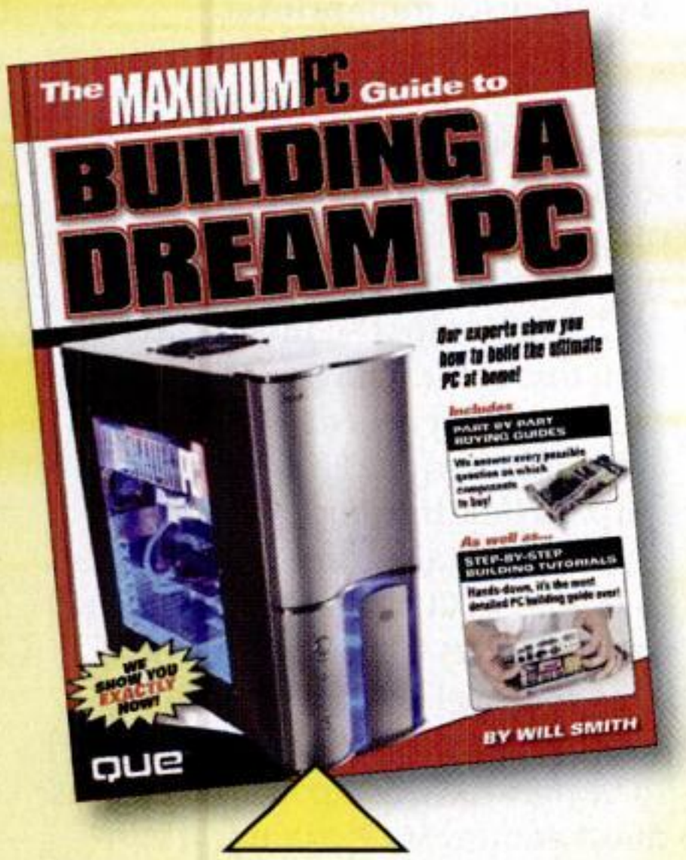
$450, www.dlink.com

Copyrighted material

MAXIMUM... BOOKS?

300 PAGES EACH!

ALL COLOR! NO ADS!



Yes. It's true. MAXIMUM PC introduces the next generation in computer books!

Maximum PC Guide to Building a Dream PC

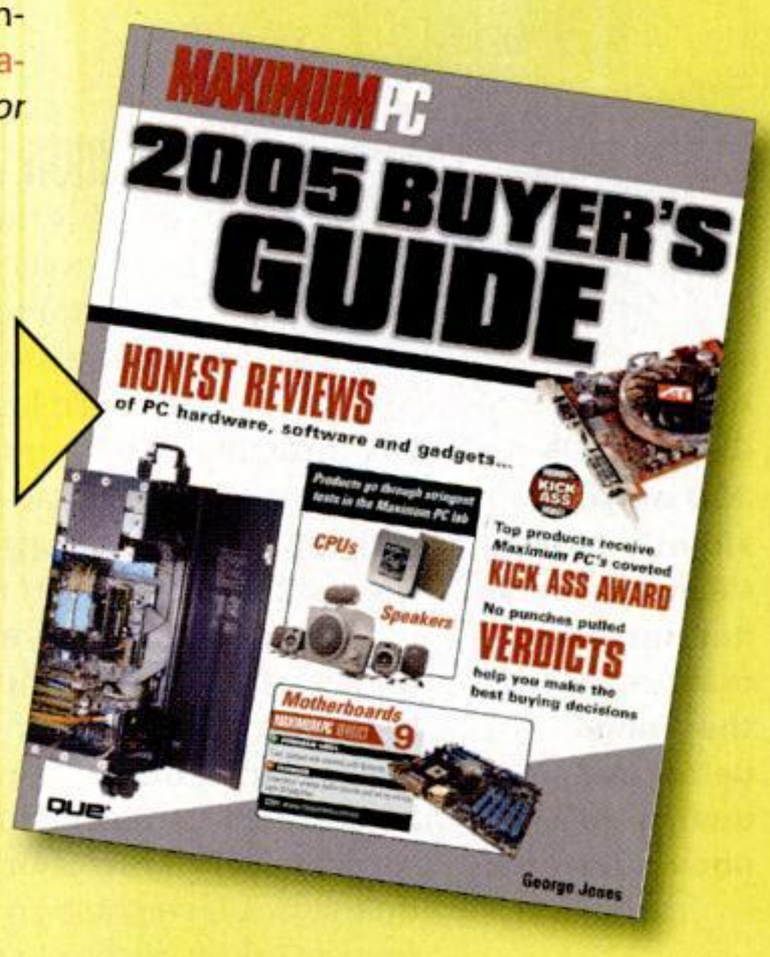
It's the biggest, meanest, *most complete* PC building guide we've ever created! Not only do we show first-time PC builders *everything* they need to know about assembling a computer from scratch, we also divulge the truth behind competing hardware technologies, and show you how to make the smartest parts choices. Includes configuration plans for six different Dream Machine archetypes. *By Will Smith, technical editor*

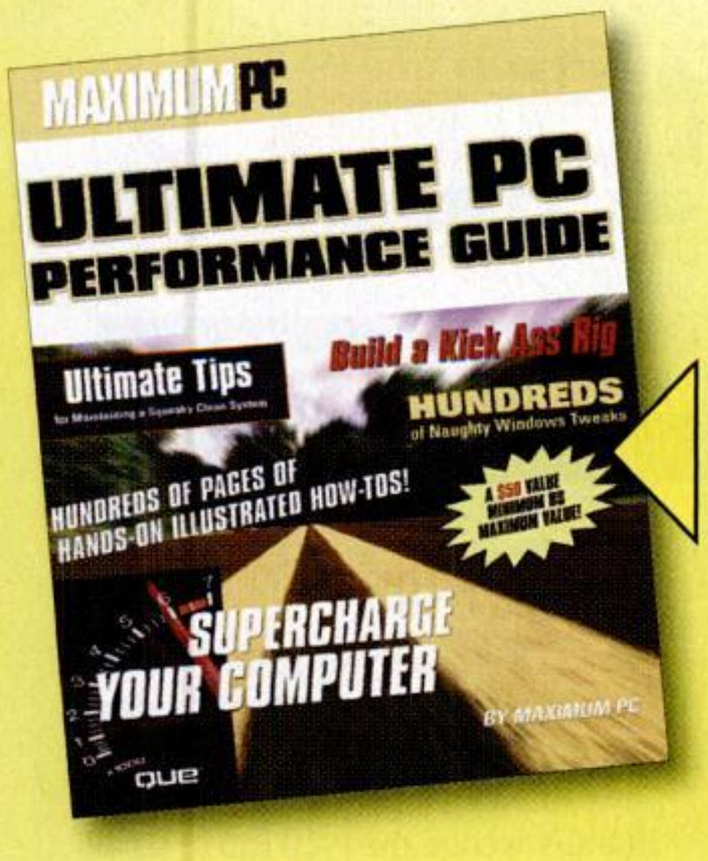
- **$29.99, ISBN 0-7897-3193-2**

Maximum PC 2005 Buyers Guide

Get an insider's peek at 2004's most exciting Lab experiments, plus forward looks at the gear you *must* know about in 2005. Includes the hidden story behind *Maximum PC* benchmarking, and a full compendium of our most positive—and brutal—2004 product reviews. Special Ask the Doctor and Watchdog wrap-ups make this a veritable *Maximum PC* almanac! A must-have reference book for faithful readers of the magazine. *By George Jones, editor-in-chief*

- **$29.99, ISBN 0-7897-3194-0**





Maximum PC Ultimate PC Performance Guide

All of *Maximum PC's* "newsstand only" special issues bound into a single book—a $50 value! Five issue's worth of content, and a must-have treasure for *Maximum PC* fanatics. Includes all the articles from *355 PC Answers, Unauthorized Guide to Windows XP, Build the Perfect PC,* and both the 2002 and 2003 editions of our *Ultimate PC How-To Guide.* From PC building, to Windows tweaking, to overclocking, and much, much, MUCH more, this 320-page volume covers every hardcore PC subject imaginable.

- **$29.99, ISBN 0-7897-33172-X**

que®
www.quepublishing.com

Go to www.maximumpc.com for buying info.

Copyrighted material

Pocket Printer Punchout

We Lab-test three tiny printers that promise perfect 4x6 photographs

Sony's high-quality output surprised us—its accurate color reproduction establishes it as our favorite mini-printer.

Huge 13x19 prints may look impressive, but most consumers—including us—prefer more manageable 4x6-size photographs, so we decided to review a batch of printers that output nothing but smaller format images. While these pocket printers themselves are small in size, it doesn't diminish their quality; in fact, the dye-sublimation process used by three of these printers is superior to the average ink jet you can purchase. The trade-off, of course, is that you lose the ability to print bigger photos. But at sub-$200 price points, these wee printers would make a perfect complement to your existing home photo studio. Let's take a look.

—GORDON MAH UNG

Although Canon's CP-220 outputs slightly bluish flesh tones by default, Lab tests revealed the image detail and quality to be above average

Canon CP-220

Roughly the size of a fat CD wallet, the CP-220 is the most portable printer in this roundup. Although it lacks the battery capability of its big brother, the CP-330, it's not a big deal—most people will keep this plugged into a wall socket for day-to-day use.

Like the Sony and Olympus printers reviewed here, the CP-220 features a dye-sublimation engine that produces images by heating up a colored ribbon that permeates the paper and lays down color in multiple passes. If you hold an image from an ink jet up to your nose, you'll see tiny patterns of dots instead of the continuous color of pictures developed at your local mini-lab. With dye subs, photo output is similar to that of a mini-lab.

We found the CP-220's output to be impressive, although it tended to be slightly "cold." For instance, in some of our test images, we had to bump the saturation levels up in order to restore red and pink flesh tones. In other test prints, however, the CP-220 actually produced the most accurate colors. Under the Maximum PC Lab magnifying loupe, the CP-220 Canon trailed behind Sony's DPP EX-50 in terms of image detail, but held its own overall.

While the CP-220 wins the portability category hands down, it still consumes a fair amount of space—the CP-220's paper cartridge extends out about six inches, and another five inches of space behind the printer must be kept clear during print jobs. All told, the printer requires about 16 inches of desk space to operate. Still, it's amazing that Canon can deliver such quality image output into a tiny package.

Canon CP-220

MAXIMUM PC VERDICT 8

+ DYE SUBLIMATION

High-quality levels—and it's tiny.

– DOT MATRIX

At default setting, printer tends to render too much blue in skin tones.

$170, www.canon.com

Sony DPP EX-50

We'll admit it: Sony's DPP EX-50 surprised us. We thought printer powerhouses Canon and Epson would kick butt and take names. Instead, Sony's EX-50 was our favorite of the bunch. Its output is the best in terms of detail, which is no shocker as it's spec'd at 403dpi, which is about 25 percent higher than the Canon CP-220 or Olympus P-10. While the naked eye can't discern the difference in detail level, it's evident when viewing extremely fine objects under a loupe.

But even more than the higher resolution, we love the EX-50's realistic output of flesh tones. In test prints of human subjects, we generally found the EX-50's output far more pleasing than that of the Canon or Olympus models. We say generally because in a few instances, the EX-50 actually output a little too much red.

The EX-50 also places first in terms of feature set. It boasts the Sony-mandated Memory Stick Pro port as well as a Compact Flash slot for printing directly from media. Like the other three printers here, a port also supports direct printing via PictBridge, a standard that allows the direct printing of images from a digital camera. The EX-50 is alone in offering TV support, which allows you to plug the printer into a TV using a simple composite connector, so you can use the screen to preview and select the images you want printed from the memory cards.

One ding against the EX-50 is its inability to use the onboard media reader to copy photos to your PC. With the Epson PictureMate, inserting a CF or Memory Stick gives you access to the media card from your Windows desktop. The EX-50 doesn't offer this functionality. But this is a minor nag, and given the EX-50's excellent output, it's one we can live with.

Sony DPP EX-50

MAXIMUM PC VERDICT 9

+ 35MM FILM

Most pleasing flesh tones and highest resolution of the bunch.

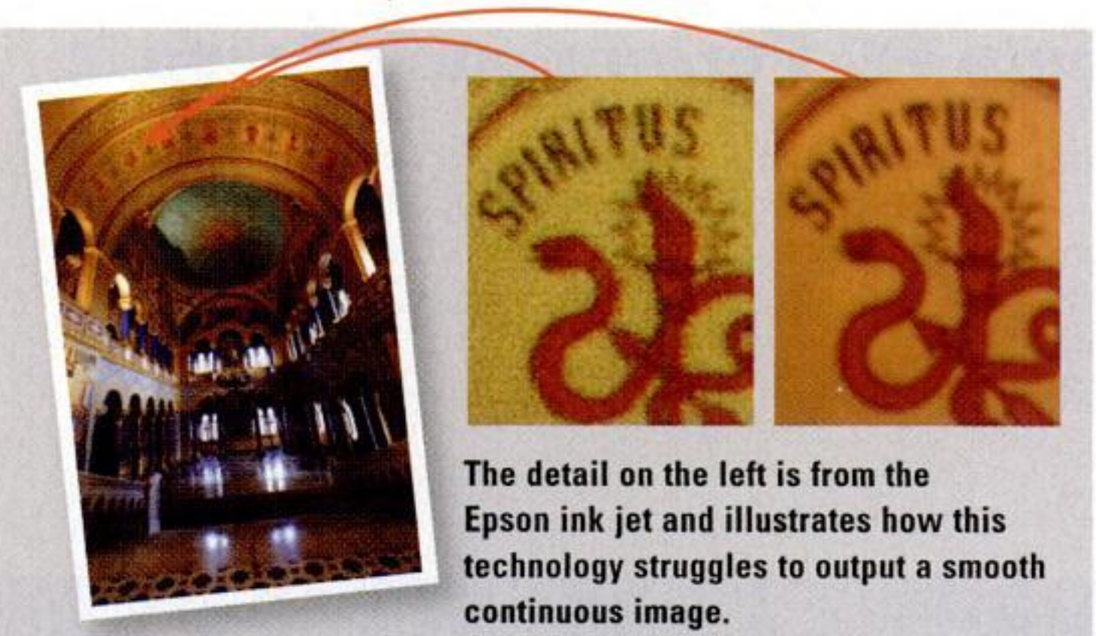
– 110 FILM

Output is a little too warm on occasion.

$170, www.sony.com

Olympus P-10

Thanks to the Olympus P-10's cube shape and small paper tray, it actually has the smallest footprint of the printers reviewed here. You can literally wedge the P-10 into a small corner of your desk or park it in your living room next to a box of Kleenex, and no one would even notice it.



The detail on the left is from the Epson ink jet and illustrates how this technology struggles to output a smooth continuous image.

Copyrighted material

Is that a high-tech Kleenex cozy or a printer? Olympus' P-10 wowed us with its size, but image quality was a downer.

Alas, if only the P-10's shape and sharp looks carried over to print quality. The P-10's output looked similar to that of Canon's CP-220 in terms of tone and clarity, but upon close inspection, we noticed jagged lines in the P-10's prints. In fact, it looked as though no antialiasing was performed on our test images before being sent to the printer. Shockingly, some of the aliasing was clear even to the naked eye! Because we printed all of our test images from the same computer with the same version of *Photoshop 7*, we couldn't blame our test rig. Updating the driver didn't help.

That's a shame, as we were partial to the P-10's style, formfactor, and attention to details such as its internal paper tray that keeps paper safe from dust. Like the Canon CP-220 and Sony EX-50, the P-10 comes bundled with a paltry amount of media—we're talking about a measly six pieces of paper stock and just enough ribbon to make six prints. What a rip. You'd think these companies would at least give you a full ribbon cartridge.

Olympus P-10

MAXIMUM PC VERDICT 6

POSED

Requires very little desk space.

IMPROMPTU

Unsightly jaggies in prints, scant media.

$165, www.olympus.com

Epson PictureMate

Of the four printers here, Epson's PictureMate is the only ink jet. Unlike a dye sub, which uses a ribbon to lay down continuous layers of color, an ink jet creates an image by spraying closely arrayed dots onto paper. We expected the PictureMate to face an uphill battle against the dye subs, and we were right. Even with a resolution of 5760x1440, the PictureMate couldn't match the output of the Canon, Sony, and Olympus printers. While we did get surprisingly good results from the PictureMate, close inspection of the test photos revealed signs of banding from the ink-head passes as well as the dotted stippling that's characteristic of ink jets. One thing's for sure—after experiencing the benefits of the dye subs, we're not inclined to ever opt for ink jet if given the choice.

Not all is bad for the PictureMate, though. The printer kicks ass when it comes to media costs. All three dye-sub printers cost more than 50 cents a picture, while the PictureMate's consumables are in the 26 cent range. This makes the PictureMate a more affordable proposition. And even though the PictureMate is about $30 more than the others, it comes with enough ink and paper to print 20 prints.

The PictureMate also features slots for xD, Smart Media, Memory Stick, Memory Stick Pro, Compact Flash, and SD. Even better, you can use the printer as a media reader (something Sony should have done with the EX-50), although data transfer rates are slowed by the USB 1.1 speeds.

Unless you're really concerned about consumables, the PictureMate just doesn't make sense next to the faster and sharper mini dye-subs.

At this price range, ink jet printers, like Epson's PictureMate, don't compare very well with dye-sub processes—but at least the price per print is good.

Epson PictureMate

MAXIMUM PC VERDICT 7

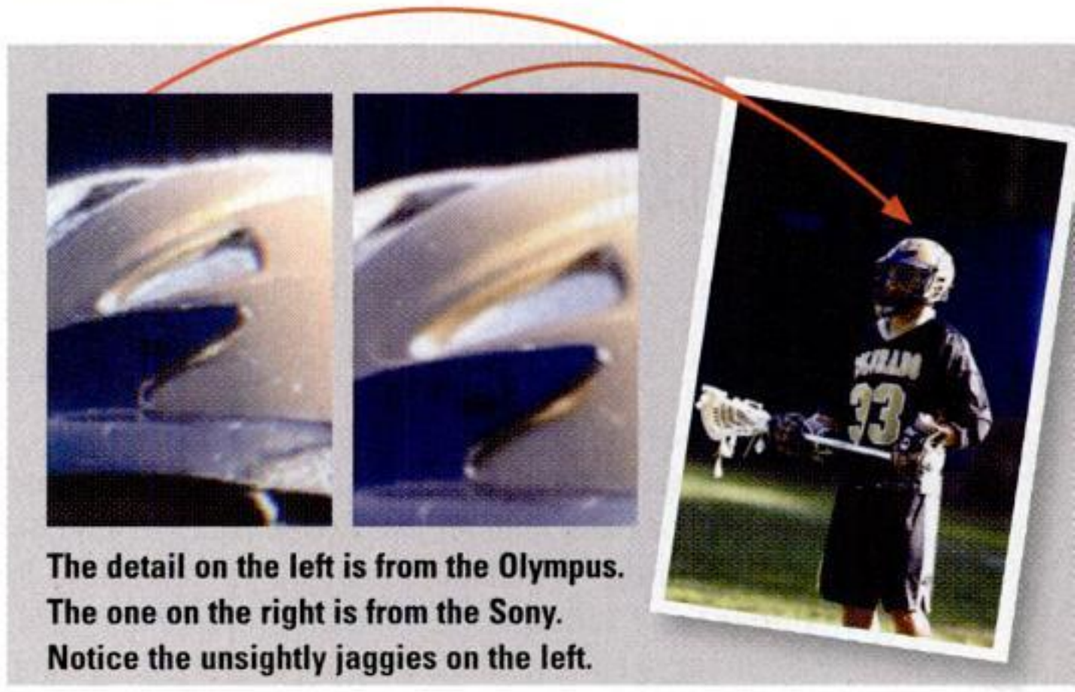
LEER JET

Cheaper consumables and still very good output.

INK JET

Slight banding, and resolution doesn't match that of dye subs.

$200, www.epson.com



The detail on the left is from the Olympus. The one on the right is from the Sony. Notice the unsightly jaggies on the left.

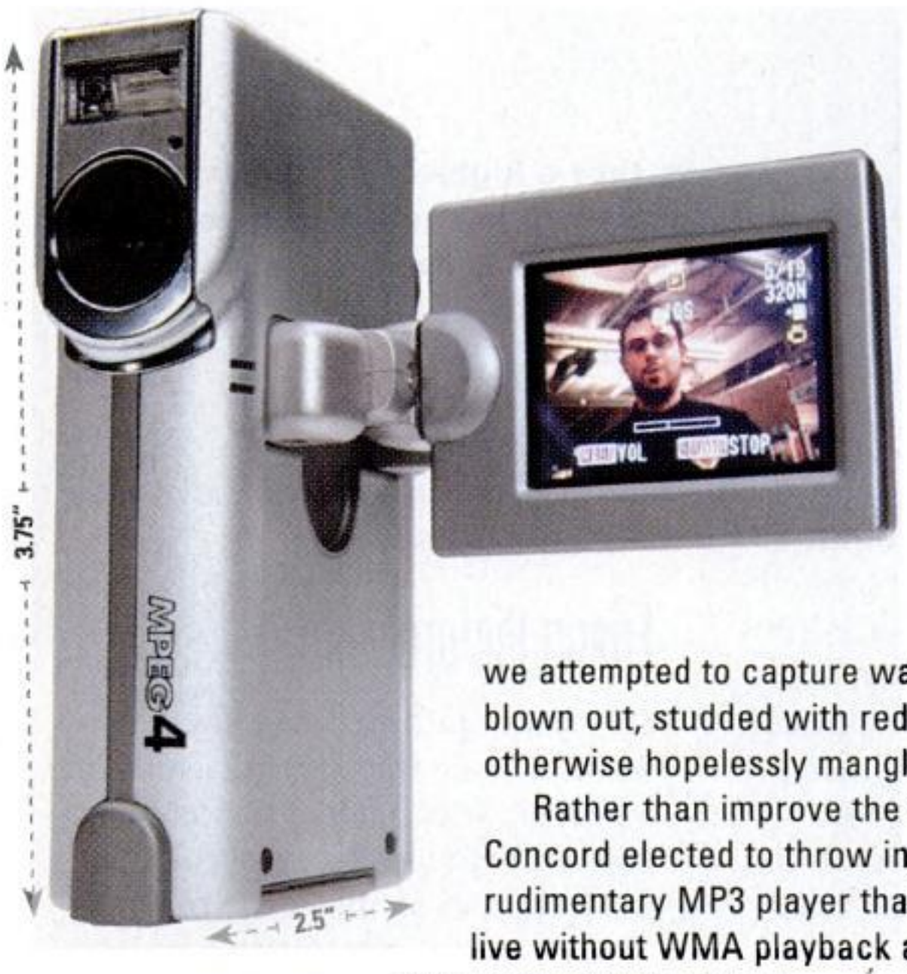
SPECS

MAKE	SONY	CANON	OLYMPUS	EPSON
MODEL	DPP EX-50	CP-220	P-10	PictureMate
TYPE	Dye sub	Dye sub	Dye sub	Ink jet six color pigment based
PRICE	$170	$170	$165	$200
PRINT RESOLUTION	403dpi	300dpi	310dpi	5760x1440dpi
DIRECT CAMERA-PRINTING SUPPORT	PictBridge	PictBridge, DirectPrint, DPOF	PictBridge, DPOF	PictBridge, DirectPrint
PRINT TIME (SECONDS PER 4X6 PRINT)	87	100	57	141
MEDIA COST (PER 4X6 PRINT)	51 cents (includes ribbons)	52 cents with 36-pack, 39 cents with 108 pack (includes ribbons)	52 cents with 40pack, 34-cents with 100 pack (includes ribbons)	26 cents with 100 pack (includes ink)
MEDIA SLOTS	Memory Stick, Memory Stick Pro, Compact Flash (FAT 32 Support)	None—but supports direct printing from digital camera via USB	None but supports direct printing from digital camera via USB	Compact Flash (FAT 32), Memory Stick Pro, SD, xD, Smart Media

Copyrighted material

Concord Solid-State DV Camera

A crappy cameraphone—without the phone



The small size of the DV2020 gets oohs and aahs. Unfortunately, the video output gets only guffaws.

Oooh, it's a good idea—a digital video recorder that uses itty-bitty flash memory for storage instead of bulky tapes! D'oh, it's a bad idea—the images look like crap!

Actually, the Solid-State DV Camera is a good idea gone bad. We initially squealed with delight when we unpacked this lil' bugger, which is only slightly larger than a Winston hard-pack. It feels and controls just like many other mini DV cameras we've used. On one side is a fairly sharp foldout LCD screen measuring 1.25-inches wide and an inch high that can be rotated on two axes for simultaneous viewing and shooting. On the other side is a wheel for selecting a function (recording, playback, etc.). The battery lies discreetly flush with the side of the camera, and the SD card fits into a covered slot on the bottom. Sounds great, right? Lights, camera, action!

Cut! What comes out of the camera hardly resembles what goes into it. Video clips are internally compressed to DivX files at a maximum resolution of 320x240 at 17 frames per second, resulting in files sizes of about 6MB per minute. But the quality—or lack thereof—is equivalent to cameraphone video clips. That's just sad. All our video clips came out hazy, dark, and desaturated in color, particularly around the corners. Even clips taken outdoors in bright daylight had a twilight cast reminiscent of F. W. Murnau's 1922 shadowy classic *Nosferatu*. This effect is great for German expressionists, but terrible for everyone else. Even worse, moving images constantly warp and ripple as the camera moves.

Snapshots from the 2-megapixel CCD don't fare any better. Regardless of lighting conditions or camera settings, every moment we attempted to capture was blurry, washed out, blown out, studded with reddish-purple artifacts, or otherwise hopelessly mangled.

Rather than improve the imaging hardware, Concord elected to throw in a voice recorder and rudimentary MP3 player that sound fine—if you can live without WMA playback and if you can tolerate an awkward control scheme.

Although better than 1987's $100 tape cassette-based Pixelvision camera, we're convinced that Concord's DV2020 is going to disappoint everyone except the occasional art student who wants to produce mysterious, tortured videography for his or her student film festival.

—LOGAN DECKER

MAXIMUM PC VERDICT 3

+ MATINEES

It's a great concept.

− EDITED FOR TELEVISION

No amount of tweaking the settings produced decent video.

$230, www.concord-camera.com

Arco EZBackup

Drive backups don't get much easier than this

Once you install your own hard drives, this honkin' two-drive cage slides into two 5.25-inch bays and lets you lock your system with the turn of a key.

The Arco EZBackup isn't a RAID 1 array, nor is it a backup drive. Instead, it's a quasi blend of the two that is both effective and unique. The EZBackup is strictly BYOD, and is made for IDE storage devices. It contains two removable drawers labeled "source" and "backup;" you install your primary hard drive in the source drawer and a backup drive of equal size in the second drawer. The entire apparatus is then plugged into a single power connector and a single IDE cable, and mounted in two adjacent 5.25-inch drive bays. It should be noted that the apparatus includes its own cooling fan, as well as a lock that allows you to keep the cage securely shut. There's also a security setting that allows you to lock the drives in such a way as to prevent the PC from booting.

Once the EZBackup is up and running, you use your primary drive like you always have. We found ourselves particularly impressed by the included software, which lets you create a mirror image on the second drive. This image is a 100 percent copy, meaning it's completely bootable in case the primary drive fails. Once the primary drive is mirrored, you simply create a backup schedule. The backup can be an entire image of the drive, new or modified files only, or specified folders and files. The software is extremely easy to use, and we experienced zero hassles in testing. Scheduled backups took place right on time, and after we copied the entire contents of our main disk to the second disk, we swapped the two drives and the system booted as if it were the primary drive.

The backup program can be operated either from within Windows or by manually pushing buttons on the unit's faceplate. The initial backup of our 250GB primary drive took about 10 hours from within Windows, but you can opt for a faster mode that reduces a complete backup to about four hours—you just can't use your computer when in this mode. With the initial backup out of the way, subsequent incremental backups were quick and painless.

All in all, we really like this drive system, but it's hard for us to justify the cost when we compare the EZBackup with a standard RAID 1 array, which is basically free and capable of accomplishing similar objectives.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ DRIVE SWAPPING

Guarantees 100 percent uptime, intuitive software.

− WIFE SWAPPING

Pricey, and the initial backup took forever.

$600, www.arcoide.com

Copyrighted material

VOTE NOW!

October 1 - 31

Shape history...

www.WalkOfGame.com

The first-of-its-kind landmark honoring the icons and pioneers of the videogame industry

Walk of Game and the Walk of Game logo are service marks and copyrights of Metreon (IIC.

Copyrighted material

Unusual USB Keys

Three portable storage devices that are different in a good way

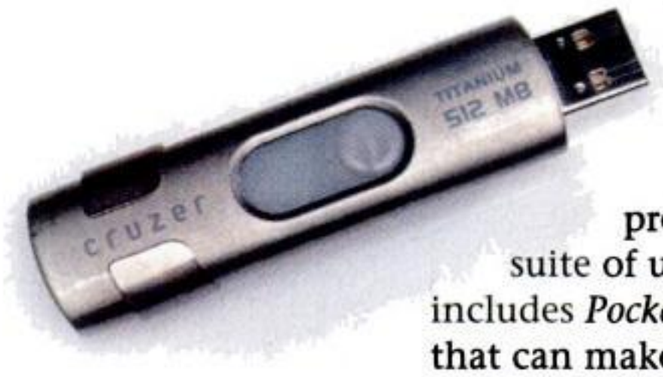
The venerable Swiss Army knife gets a hi-tech face-lift with the addition of a useful, albeit slow, USB storage key.

USB storage keys are so ubiquitous that they've become the toasters of the computer world. They come in a wide variety of shapes and sizes, but in the end they all do pretty much the same thing. So how does a USB key distinguish itself from the rest of the pack? By being different, that's how. Come along as we look at three USB storage devices that aren't quite like the others. One sports a shiny metal body. One is incredibly small. And one is more than meets the eye.

—TAE K. KIM

SanDisk Cruzer Titanium USB

The Cruzer Titanium 512MB USB from SanDisk is a slim and attractive USB 2.0 storage device with a titanium-coated case that makes it a stylish yet sturdy portable drive. This is the USB key James Bond would take with him on missions. The Cruzer also sports an LED activity light and a cleverly designed retractable USB connector that's accessed via a thumb slide.



The Cruzer Titanium's retractable USB connector prevents you from losing the cap.

The device comes preloaded with a suite of useful software that includes *PocketCache*, a program that can make periodic backups of a specified file or folder, allowing you to retain and restore lost files with the click of a button.

Unfortunately, the *PocketCache* software isn't free. The Cruzer comes with a 90-day trial version of the utility, but you'll have to pony up $20 to keep using it. We should also note that the Cruzer's titanium coating is somewhat susceptible to scratches. But these are just minor knocks against an otherwise solid USB key.

SanDisk Cruzer Titanium

MAXIMUM PC VERDICT 9

+ CRUISING

Attractive, sturdy, and comes with great bundled software.

– BRUISING

Too bad the *PocketCache* software isn't free.

$200, www.sandisk.com

Victorinox SwissMemory

The SwissMemory by Victorinox is an update to the classic Swiss Army knives that have adorned key chains for years. It comes loaded with the standard array of useful implements but it features a modern addition: a detachable 128MB USB key.

The USB key is tucked right alongside the more traditional tools: a pair of scissors, a knife, a file, a retractable pen, and a useful integrated LED flashlight that only adds to the geek quotient. Unfortunately, we were disappointed by the slow transfer rate of the USB key's outdated USB 1.1 interface. We also found it sorely missing a Phillips-head screwdriver. For the time being, we'll gladly use the SwissMemory to reenact our favorite scenes from *McGuyver*, but the device definitely needs an upgrade.

Victorinox SwissMemory

MAXIMUM PC VERDICT 6

+ BARBARA EDEN

It's a Swiss Army knife with a USB key!

– BARBRA STREISAND

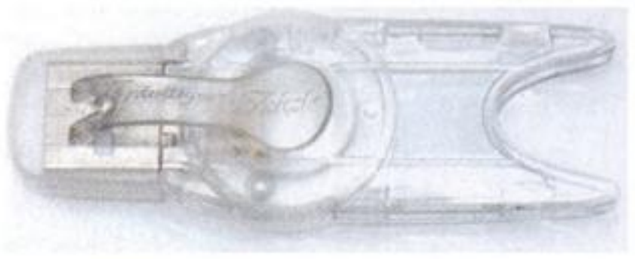
USB key is slow, bulky, and offers limited capacity.

$100, www.victorinox.com

PQI Intelligent Stick 2.0

The 128MB Intelligent Stick USB storage device from PQI is small. Really, really small. The diminutive storage element is about the size of a stick of gum and has a stripped-down USB 2.0 connector at the end; the fact that PQI is able to cram up to a gig of storage into these devices is pretty darn impressive. A handy USB adapter, which adds a measure of protection to the unit while adding only a negligible amount of bulk, is also included in the package. The adapter is cleverly designed so the IStick will only fit when it's properly aligned.

Unfortunately, there's not much more to say about the IStick. It's the smallest USB storage device we've ever tested—but surely you know the old adage regarding size and its relative importance. PQI has plans to release a line of MP3 players that will be IStick compatible; when those become available, the Intelligent Stick will become a much more attractive storage option.



We call this one Tiny Tim because it's so, um, tiny. Still, it can be had in capacities up to 1GB.

PQI Intelligent Stick

MAXIMUM PC 8

+ INVADE ZIM

It's tiny and it works.

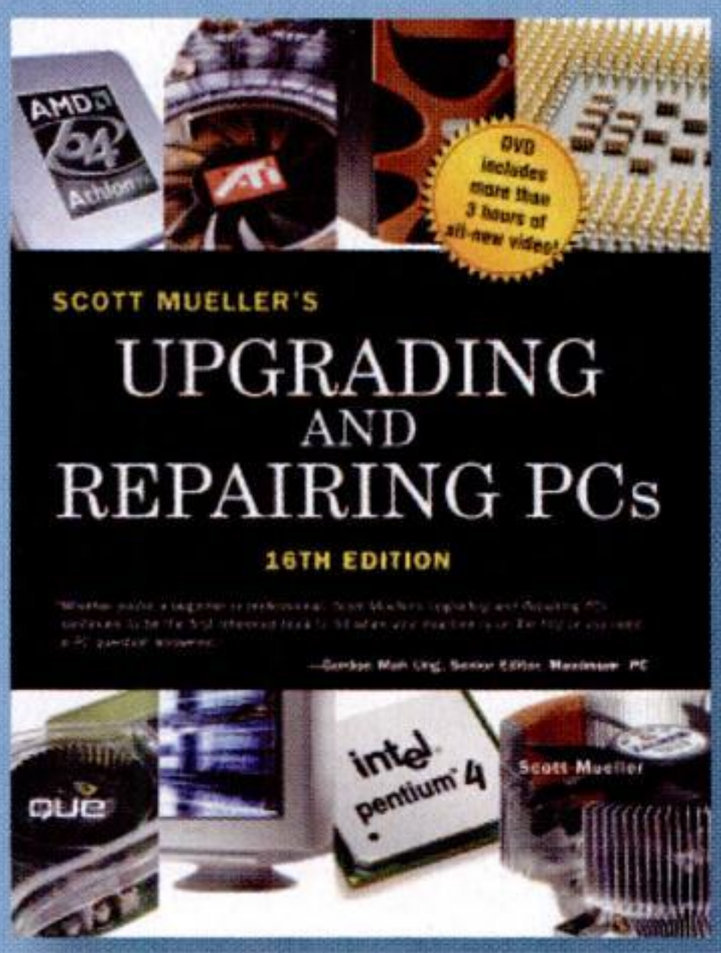
– BUTT UGLY MARTIANS

Besides its size, there's no other special functionality.

$40, ($170 for 256MB, $140 for 512MB, $230 for 1GB), www.pqi.com/tw

Copyrighted material

And on the seventh day, he rested.



Upgrading and Repairing PCs, 16th Edition, your computer Bible.

Buy your copy today at these fine bookstores.

BARNES&NOBLE BOOKSELLERS www.bn.com

BORDERS. BOOKS MUSIC MOVIES CAFE

amazon.com

MICRO CENTER The Ultimate Computer Store

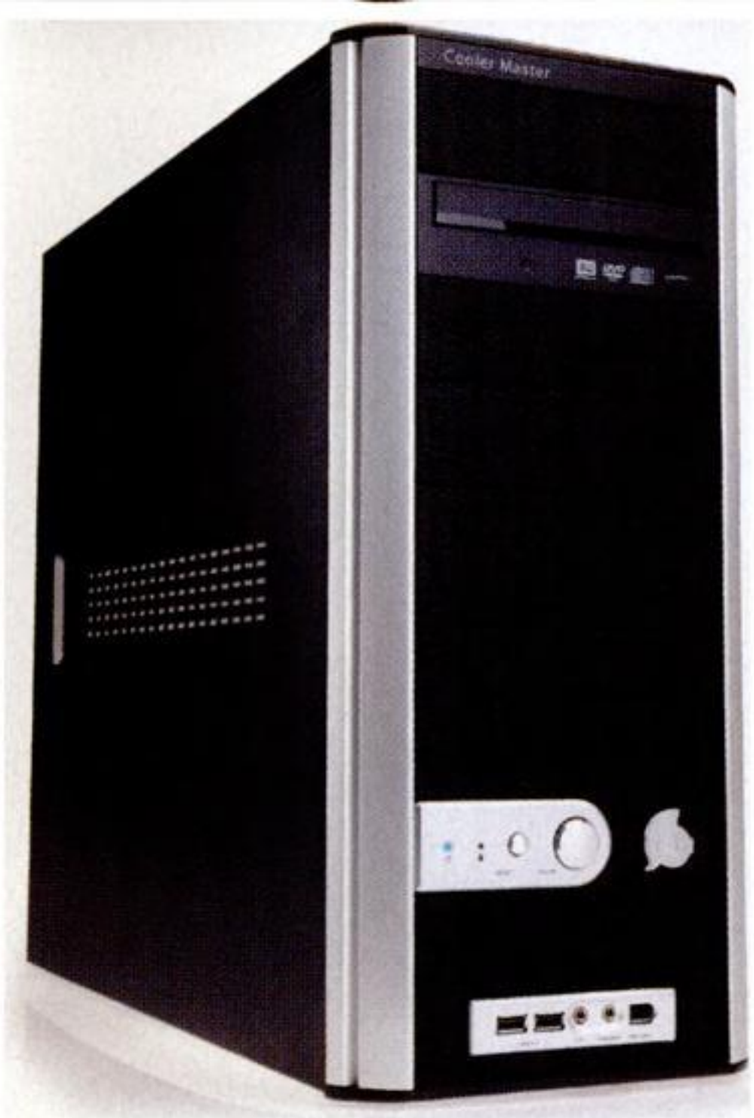
$59.99 SRP

que®

www.upgradingandrepairingpcs.com

Cooler Master CAC-T05 Centurion 5

A few blemishes mar an otherwise attractive case



The Centurion 5 cuts a few corners—and fingers—but at least it looks great doing it.

On the surface, the Centurion 5 appears to be a good-looking, well-equipped mid-tower enclosure. Unfortunately, after living with the case a few weeks, our initial enthusiasm has been tempered.

The case has the broad features and expandability we've come to expect from Cooler Master, in a quality steel shell that includes five 5.25-inch bays as well as five 3.5-inch bays, two of which fit a floppy and three for hard drives. Drives are secured in their bays with a novel sliding lock system that is surprisingly sturdy; screw holes are nonetheless available for old-fashioned builders. An 80mm intake fan up front and 120mm exhaust fan in the rear take care of cooling.

Although the Centurion 5 is constructed of steel, it remains relatively lightweight. It also has the beauty of more expensive cases, if not the robust construction. The attractive black and chrome front bezel, reminiscent of Cooler Master's fantastic CM Stacker case, is crafted from a metal mesh material backed by a soft foam filter for maximum airflow. The Centurian 5 has I/O ports for two USB 2.0 devices, a FireWire device, speakers, and a microphone jack. The included 350W power supply should provide sufficient power for all but the hungriest system configurations.

Overall, the Centurion 5 has everything we look for in an ATX mid-tower enclosure. Unfortunately, it also has some quirks we could do without. A big problem is that the front bezel is difficult to pry off, even after we discovered and removed the well-hidden screws that keep it on. Next we set about removing the metal shields that block the expansion bays—a process we found both difficult and dangerous. One staffer even shed blood after a feisty metal tab nicked his thumb! We also feel that the tool-less tabs used to lock-down add-in cards are a bit too flimsy. Thankfully, the card slots have screw holes as well, making the flimsy clips an optional pain rather than a mandatory one.

In the end, this is a better-than-average case that offers many features for the money. We were a bit put off by the front bezel, but only because we have high expectations of any Cooler Master product.

—E. WILL GREENWALD

MAXIMUM PC VERDICT 7

+ MAXIMUS

Good features, sturdy construction, and classy exterior.

– MINIMUS

Awkward front bezel, front panels, card clips.

$95 (street), www.coolermaster.com

Silverstone SST-TJ06

BTX cooling benefits—in an ATX case!

If you've ever rolled your car, you'll understand how the motherboard probably feels being upside down in this Silverstone case. The SST-TJ06 even opens on the right side, which is just like... whoa.

With BTX cases looming large on the horizon, Silverstone has come up with a novel way to inject new life into the aging ATX formfactor—by flipping the traditional case enclosure upside down and making it BTX-like, for lack of a better description. Like a BTX enclosure, the TJ06 opens on the right side, the motherboard is installed upside down, the CPU and memory reside at the bottom of the case, the AGP and PCI cards are installed face-up, and the drives live in the upper recesses. It's, like, a real mind-blower, man!

The coolest thing about this case, though, is an enormous plastic shroud that covers the entire lower portion of the interior. 120mm fans spin at both ends, with the front fan sucking air in and the rear fan exhausting it, creating an effective wind tunnel over the CPU area. We used a heatsink/fan for our Pentium 4 test motherboard/CPU and the shroud provided ample space for it. Though the shroud works fine, we were dismayed to find that three of the four plastic tabs used to hold it in place broke off during testing.

Above the motherboard are separate cages for up to six hard drives, two floppies, and five optical drives, all of which use included drive rails. The drive rails are tool-less, which means they simply snap onto the drives. Unfortunately, we found the rails to be flimsy, and we had to hammer our floppy drive's rails into the holes in order to make them fit. There are also no hard drive cooling options, which is weak.

The motherboard tray is not removable, but it has a big hole in it through which you can feed the power supply leads for a tidier interior. There's also a well-stocked side I/O shield with four USB ports, FireWire, and audio jacks. And the front bezel locks.

All in all, the design of this case is quite clever and succeeds in bringing BTX benefits to ATX users. But it doesn't quite match the level of quality we've come to expect from Silverstone.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ CASES

Roomy, great CPU cooling, plenty of drive bays.

– BRACES

Shroud clips broke, drive rails are cheap, all-steel chassis.

$140, www.silverstonetek.com

Copyrighted material

Zen Portable Media Center

Innovative new media player leaves much to be desired

See that green button in the top left corner? That's the mark of Microsoft's Portable Media Center. While the OS remains fixed, companies like Creative can customize the exterior to their heart's content.

As far as lustworthy gadgets go, Creative's Zen Portable Media Center is guaranteed to elicit jealous oohs and aaahs from friends, family, strangers, and crusty Maximum PC Lab personnel alike. Aside from Archos' AV400 (which received a 9 rating last month), RCA's Lyra (soundly dissed a few months prior), and a handful of other Portable Media Centers, not many other handheld media players boast a 3.8-inch, 320x240 screen that can play TV, movies, pictures, and music on the go. Unfortunately, DRM issues and limited recording options disappointed us.

The unit's 20GB hard drive accommodates a boatload of files. At one point, we had more than 11 hours of video, 2,500 songs, and 3,000 pictures on the device, and we still had room to spare. The battery life is fairly impressive and competitive with Archos' AV400; our first few charges netted us a little less than six hours of life. In theory, you can use the Zen's AV-out port to watch your movies and music on a regular-size TV, but we experienced mixed results. On our high-end HDTV, the images were badly blown-out and heavily pixilated. On lower-end displays, the degradation isn't as bad.

Based on the embedded version of Windows XP—which allows for instant on and off—the Portable Media Center is an extension of Microsoft's Media Center PC effort (think Tivo plus a DVD player). The theory goes something like this: You plug the Zen PMC into your PC via WinXP Media Center Edition, *Beyond TV,* or the recently released *Windows Media Player 10,* and it automatically downloads any TV shows and movies you've recorded, as well as music and photos you've recently copied to your hard drive.

Reality, unfortunately, is a different matter. As an example, when *Windows Media Player 10* first synched up with our PC, it mistakenly snagged thousands of images and song snippets from our vast collection of PC games. This made finding real music and photos a pain.

We also discovered that transferring our batch of test videos—a random assortment of *The Simpsons,* music videos, downloaded AVI snippets, and more—to the player took a *long* time. On the Lab's fastest rig, it took 23 minutes to convert and then transfer a 30 minute video file. Users of Media Center PCs will have it easier; the new version of the Windows XP Media Center Edition OS can automatically convert television programs when it finishes recording them.

Unfortunately, this synergy comes at a price. Because the Zen Portable Media Center lacks the Archos AV400's ability to directly record TV, if you don't have a PC with Media Center or *Beyond TV,* you're not going to be watching any recorded television programs—unless you download them illegally. This is a massive flaw.

An even graver concern is that after purchasing several classic videos of historic baseball games from **MLB.com**—a feature Microsoft touted in previews of the Portable Media Center—our attempts to transfer the games were soundly rejected by the unit's built-in digital rights management. That's inexcusable, and raises a gigantic red flag regarding the implementation of DRM at the hardware level.

—GEORGE JONES

MAXIMUM PC VERDICT 6

+ TV TO GO

Video, music, photos, and more—in the palm of your hand. Audio quality is good.

– TV TO GO

Overly dependent on Media Center PCs; issues around DRM.

$500, www.creative.com

ANYTHING BUT AVERAGE

Game X5

Intel® Pentium® 4 530 HT Technology 3.0GHz 1MB Cache
512MB Corsair Dual Channel DDR SDRAM Memory
ATI RADEON X300 PCI Express 128MB TV and DVI Out
Intel® High Definition Audio
Cyber Acoustic 3 Piece 68 Watt Speaker System
80GB Seagate Serial ATA Hard Drive
420 Watt Dual Fan Power Supply
Microsoft® Window® XP Home Edition
12 Months Next Day On-Site Warranty
PlanetCare 24x7 Technical Support

$1395.00*

To order call
1-866-486.4959
Customize it online at
www.planetcomputers.com

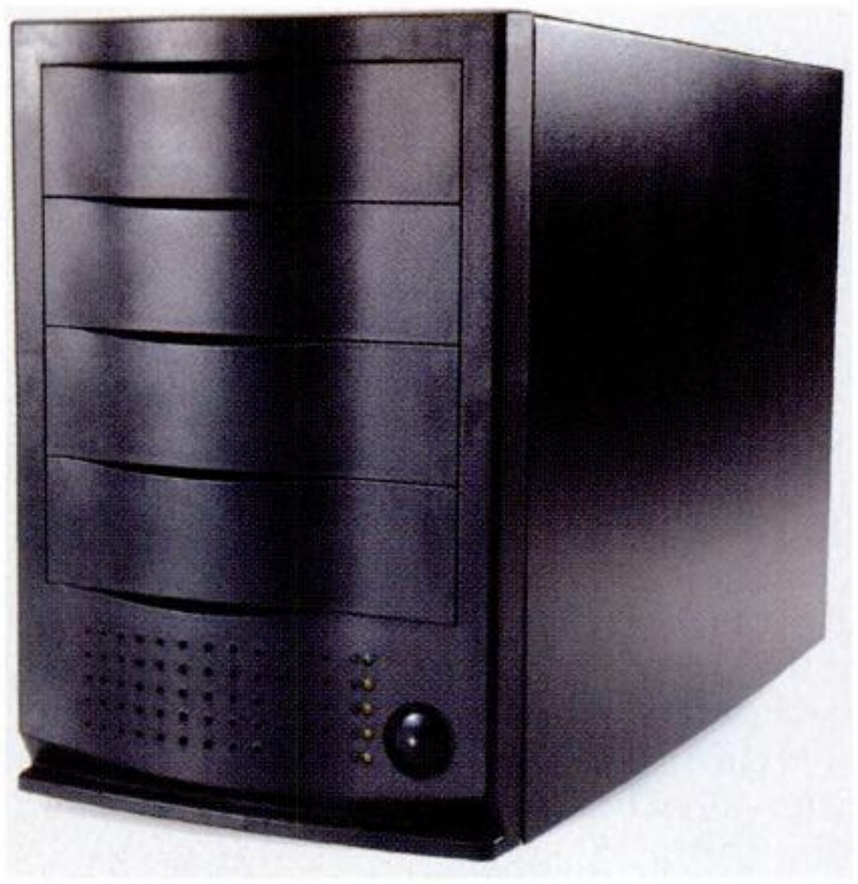
PLANET® COMPUTERS

*Price and system configuration subject to change without notice.

Copyrighted material

MacGurus 4-Bay Burly SATA Kit

This DIY storage solution is A-OK, but is it sufficiently cool?



Our review unit came without drives, but you can buy Burly Kits that include either 74GB Raptors or Hitachi 7K250 hard drives.

The idea behind the Burly Kit is this: You want to run a four-drive array for backup or storage, but either your PC is too cramped or you don't want that many loud, steamy drives raising Cain inside your case. The alternative is an all-in-one package that includes a four-drive enclosure, a dedicated 300W power supply, and an 80mm rear exhaust fan—in other words, the Burly Kit. The cooling is adequate, but in addition to the exhaust fan we'd like to see a fan in the front of the enclosure to blow cool air over the drives. (You can buy optional cooling add-ons from **www.macgurus.com**.)

Cooling concerns aside, the enclosure holds four drives that can be either 5.25 or 3.25 inches in size. The only catch is that the drives have to be SATA, and the selection of 5.25-inch optical drives is slim these days. The kit includes four internal SATA cables, four 3-foot external SATA cables (you can order 6-foot cables for an extra $20), and four 3.25-to-5.25-inch conversion brackets. Indeed, as promised by the Burly Kit's packaging, there is "some assembly required." While all the necessary parts are included and clearly labeled, the Kit is definitely not meant for folks who are averse to tinkering.

To get our review unit up and running, we had to install adapter brackets on each hard drive and lower them into the enclosure. We then had to install the backplane connectors and SATA adapters. The only component not included is a PCI SATA adapter with external ports. You either have to buy one separately or just run the external cables through an open PCI slot space to the SATA ports on the mobo.

The result is an external drive array that runs just as fast as an internal setup—you can't say that about any USB or FireWire solution. It's just that in exchange you incur the additional cost, required assembly, and limited cooling.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ CASE AT FRY'S

Quality construction, easy assembly.

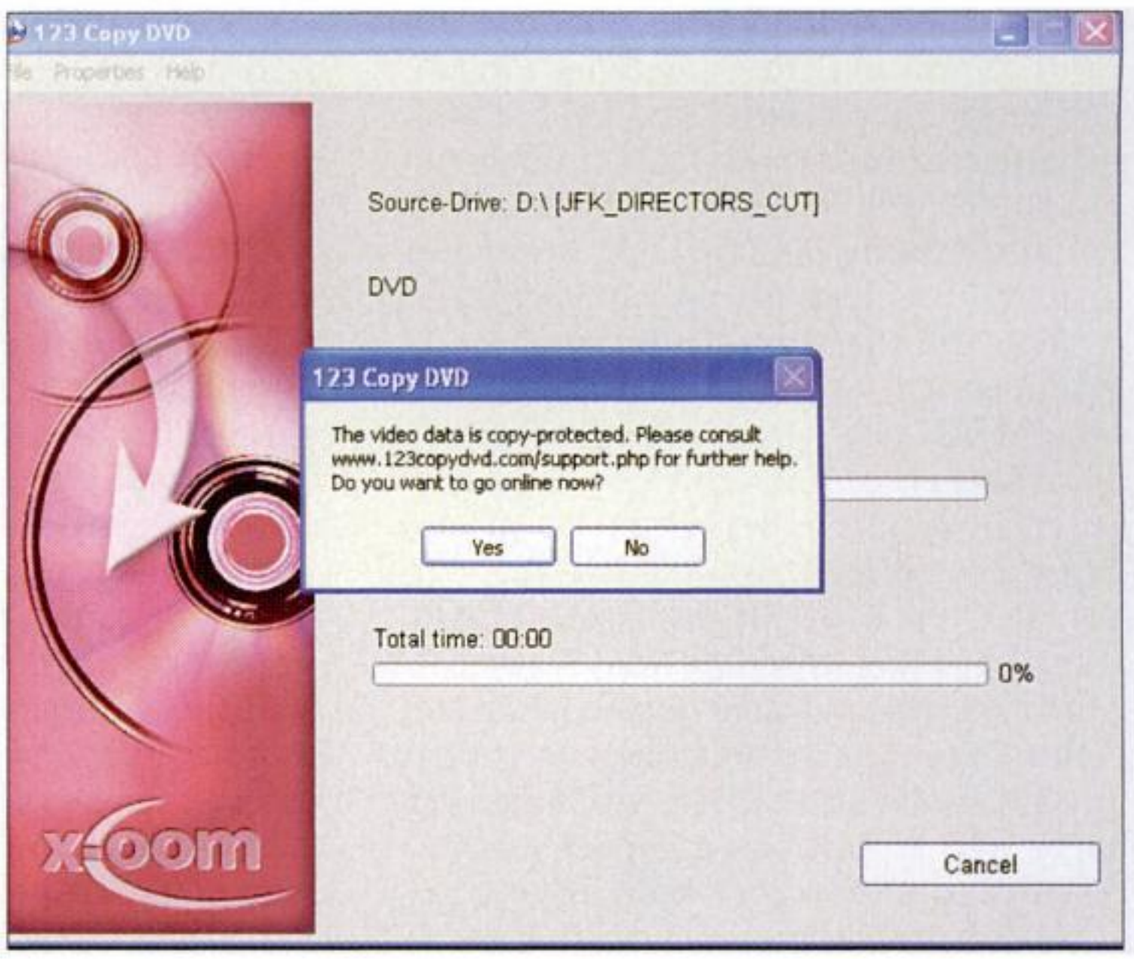
– MACE IN EYES

A single exhaust fan and no SATA adapter.

$215 (120 for 2 drive unit), www.macgurus.com

123 Copy DVD

Burning DVDs is as easy as 1-2-3. Or is that 3-2-1?



Unlike the now-defunct *DVDXCopy*, *123 Copy DVD* doesn't let you copy squat without first downloading a plug-in.

You shouldn't confuse *123 Copy DVD* with the now-defunct 321 Studios' *DVDXCopy*, but we can see how you might make that mistake, what with the similar packaging and the whole "321" and "123" thing.

Unlike *DVDXCopy*, which lets you burn movie DVDs right out of the box, *123 Copy DVD* doesn't touch copy-protected movies—unless you download an additional plug-in, which just happens to snap right into the program. In other words, *123 Copy DVD* manges to skirt the thorny legal issues.

Once we obtained the small plug-in we were off and burning. *123 Copy DVD* capably transcodes video, even in cases where the movie is too large to fit on a single-layer disc. Out of the box, the program doesn't yet support dual-layer discs, but the company says it will soon add the feature.

We used the exceedingly long director's cut of *JFK* to test the program's transcoding ability. All other DVD copying programs we've tested have produced unsatisfying output when it comes to this oversized, three-hour-plus movie, but *123 Copy DVD* performed admirably. We compared the output from it with a disc made using *DVD Shrink* (**www.dvdshrink.org**), a freeware DVD transcoding and ripping program that's popular among the staff. *123 Copy DVD's* copies generally looked better. While *DVD Shrink* can be tweaked for better results, we think the two apps are for different audiences. *DVD Shrink* fans are advanced users, while *123 Copy DVD* users are likely to be the fire-and-forget crowd.

One feature we like in particular is that *123 Copy DVD* doesn't force you to activate the app online like other commercial DVD duping programs. When developers put this restriction on their software, it means your ability to reinstall the app in the future depends on the continued existence of the company.

—GORDON MAH UNG

MAXIMUM PC VERDICT 8

+ STAR TREK II

Easy to use and decent transcoding.

– STAR TREK IV

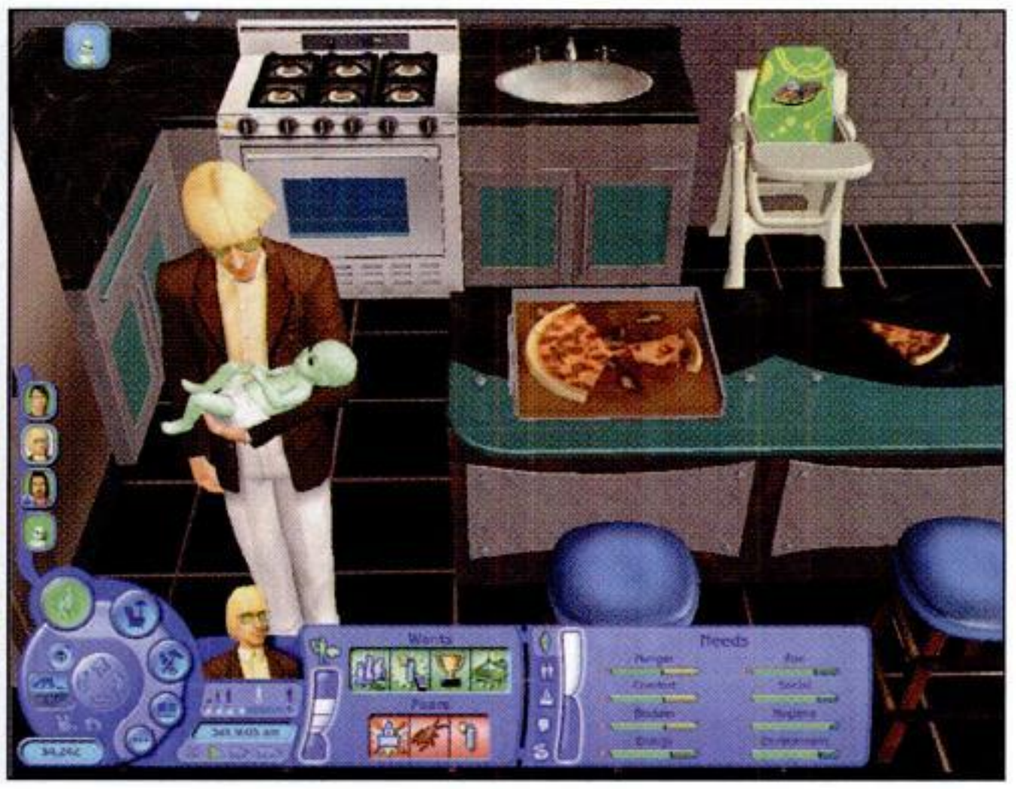
Can't dupe copy-protected content without obtaining a plug-in first.

$30, www.123copydvd.com

Copyrighted material

The Sims 2

Even more addictive than the original!



One of the neighborhoods in the game resembles Roswell, NM, so it wasn't surprising when our male Sim gave birth to an alien love child.

MAXIMUM PC KICK ASS PRODUCT

Wielding control over tiny, artificial people has been a dream of ours ever since we began life as tiny artificial people in a bubbling vat of purple bio-enriched water in Livermore, California some 20 years ago. This dream was brought to entertaining fruition when EA's instant classic *The Sims* was first released in 2000. Thankfully, we have even *more* control over our Sims' lives in this recently released sequel.

In the first game, you concentrated primarily on meeting the Sims' basic human needs such as "bladder," "comfort," and "fun." In the sequel, the Sims largely meet these needs on their own, allowing you to focus on more entertaining aspects of play, like helping them achieve higher-level "aspirations" and avoiding "fears." The aspirations are determined by which life path you choose for a given Sim upon his or her creation—options include love, knowledge, money, and so forth.

If you choose money as a Sim's lifetime goal, for example, he or she will aspire to acquiring certain dollar amounts and possessions. As these goals, which change on a daily basis, are achieved, the aspiration meter goes up, fueling the Sim's mood and earning points you can use to buy cool-looking, game-changing magical gear. The opposite of the aspirations are fears, which range from missing work to setting oneself ablaze. Too much exposure to fear events can cause a Sim to literally go insane, which is entertaining, to say the least.

Overall, the aspirations offer a nice diversion from the day-to-day routine of making sure your Sims are fed and in bed on time. In a typical day, a Sim's goals might include eating cereal, giving his girl a back rub, buying a painting, and avoiding being fired—or rejected by his lady friend.

In this sequel, your Sims now grow older throughout the game and can eventually retire on a pension, if they have one. They can "woohoo!" with each other, fart and burp after meals, have affairs with the hired help, die of old age, and even be abducted by aliens. And that's just the tip of a very big iceberg of colorful actions and options.

The use of full 3D adds an enjoyable new twist by making the Sims look a lot more lifelike and granting almost unlimited camera placement. Sadly, the game world's heightened detail causes its graphics engine to chug along on even high-end PCs. We ran it at 1024x768 on a GeForce 6800 GT and it still hiccupped occasionally.

In the end, the best aspect of *The Sims 2* is that anyone can pick it up and immediately enjoy it. That was the magic of the original game—and it's doubly good this time around.

—JOSH NOREM

New in *The Sims 2* is the ability to play your own AVI files on your Sims' TV channels. Note *Beavis and Butthead* on the right.

MAXIMUM PC VERDICT 9

THE SIMS

A complex game that's incredibly easy to play, and superb graphics.

SINGLES

Extremely addictive, and chugs on even a high-end rig.

$50, www.sims2.com

ANYTHING BUT AVERAGE

Game X7

Intel® Pentium® 4 550 HT Technology 3.4GHz 1MB Cache
1024MB Corsair Dual Channel DDR2 SDRAM Memory
NVIDIA® GeForce™ PCX 5900 PCI Express 128MB DDR
DVI & TV Out
Intel® High Definition Audio
Cyber Acoustic 3 Piece 68 Watt Speaker System
160GB Seagate Serial ATA Hard Drive
420 Watt Triple Fan Power Supply
Microsoft® Window® XP Home Edition
12 Months Next Day On-Site Warranty
PlanetCare 24x7 Technical Support

$2495.00*

To order call
1-866-486.4959
Customize it online at
www.planetcomputers.com

PLANET® COMPUTERS

*Price and system configuration subject to change without notice.

Copyrighted material

Games in the Pocket? Don't Knock It!

We review five of the latest Pocket PC games

Remember how in their heyday shareware games were so clever and addictive that they should have been classified as narcotics? Well that magic is back—only now you'll find the same scrappy thrills on a Pocket PC PDA. Not every game is a winner—admittedly, the signal-to-noise ratio on this platform is pretty low—but if you step away from *Doom 3* long enough to check out some of these titles, you'll remember the good times a little game can deliver. Also, there are free demos for all these games, so you can try before you buy.

—LOGAN DECKER

K&G Arcade

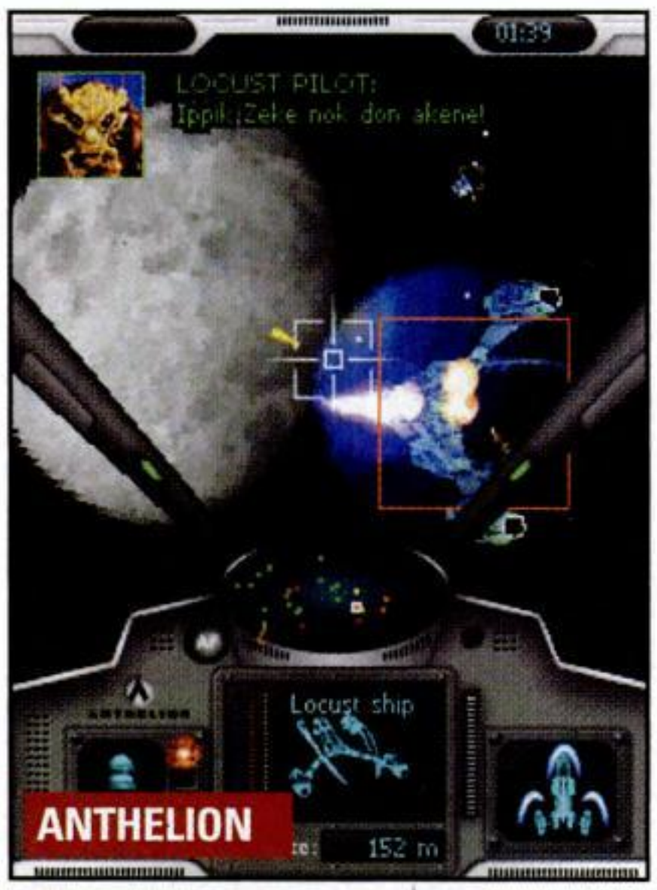
In this plucky action game, a cape-wearing 17th century farmer is abducted by the extraterrestrial equivalents of Beavis and Butthead who, just for laughs, force their bewildered hostage to endure a series of challenges based on 20th century arcade game classics. Man, we couldn't make this stuff up. You are, naturally, the cape-guy, and to win you'll have to complete some surprisingly tough, shrunken versions of *Frogger*, *Space Invaders*, *Defender*, *Dance Dance Revolution*, and even *Whack-a-Mole*. With 25 mini-games in all (that are unlocked upon completion for replay), this is as close as you'll get to Nintendo's classic *Wario Ware* on the Pocket PC. And it's a bargain to boot.

MAXIMUM PC VERDICT: 7

MINIS: Tons of variety; just plain weird.

MUMUS: Mini-games are simple. Main character wears a cape.

$7.50, www.clickgamer.com



Anthelion

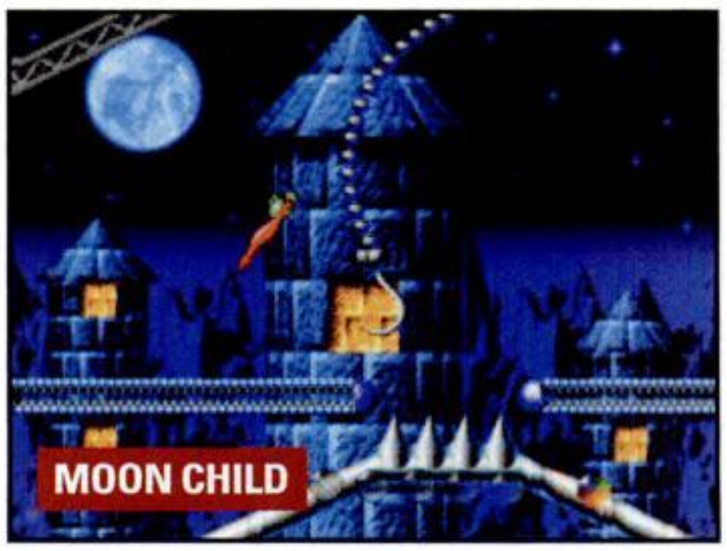
Doom 3 is probably not coming to the Pocket PC anytime soon, but you can get your 3D gaming kicks from *Anthelion*. You're a Bedouin pirate—or perhaps, a Bedouin *cargo-sharer*—and your missions inevitably result in firefights with your intergalactic neighbors. When you find yourself in a swarm of 10 missile-launching bogies and the debris of your unlucky foes, expect the lady next to you on the bus to say, "I didn't know the Pocket PC could do *that!*"

MAXIMUM PC VERDICT: 8

LOW CUT: Inexpensive, spectacular, and fun 3D shooter.

ACID WASH: No landscape mode? Sniff.

$10, www.pdamill.com



Pocket Commodore 64

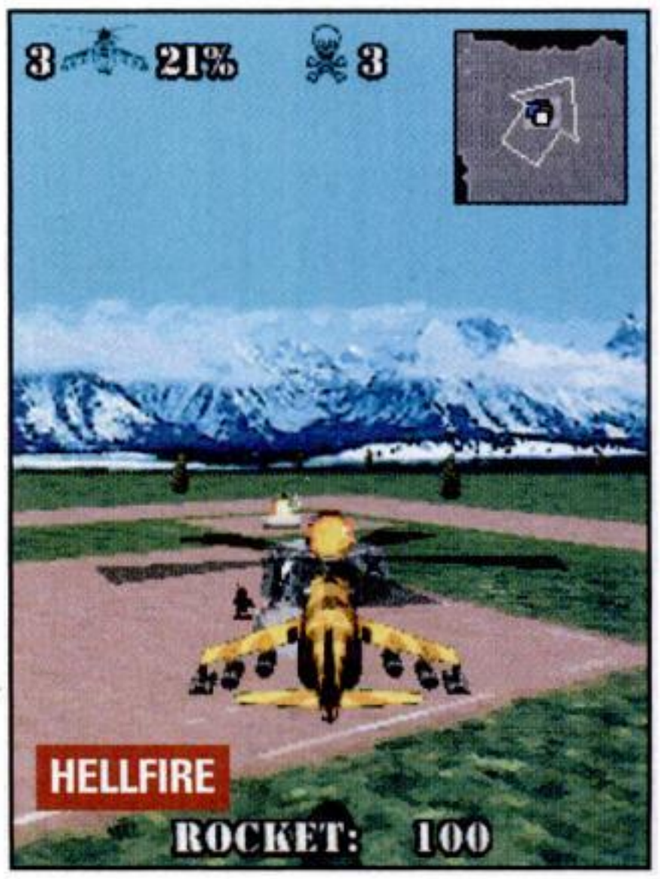
Developer Clickgamer has taken the shame out of emulation games with an officially licensed Commodore 64 emulator for the Pocket PC. If you were ever a child—indeed, if you have *any human feelings at all*—you know how great this news is. What you may not know is how great this emulator is. It's endlessly configurable, allowing you to assign touchscreen hotspots as buttons, and save games that retain your user settings. Of the 15 ROMs we tried with *Pocket Commodore*, only one refused to work correctly, although a number of games required tweaking of the settings and controls in order to play well. Of course, you must own the original game cartridge in order to legally download and use a game ROM from the Internet.

MAXIMUM PC VERDICT: 6

BUNNY SLIPPERS: Yesterday's fun lives on.

PENNY LOAFERS: There's no way to know if a specific ROM will work until you try it.

$25, www.astraware.com



Moon Child

If you really dig elves, this game is for you. And you'll get exactly what you deserve. We'll concede that *Moon Child* is gorgeous, with dazzling backgrounds and swirling, ethereal animations. And the control scheme is brilliant—you use the stylus to pull the Moon Child around on a virtual bungie cord. Draw it gently to the left and the elf will casually trot along after it. Draw it sharply up and the elf will jump higher than a cheerleader on Dexadrine. The problem is that no matter how you cut it, *Moon Child* is as dull as a TV test pattern, comprised of traveling through mazes and obstacles while avoiding the occasional moving object. Kids might find it charming, but the rest of us will simply long for *Commander Keen*.

MAXIMUM PC VERDICT: 5

ZIPPER: Beautiful graphics and a great control scheme.

BUTTON FLY: The gameplay is dull.

$15, www.clickgamer.com

Hellfire: Apache vs. Hind

America's Army emphasizes attributes essential to the armed forces: teamwork, strategy, and discipline. *Hellfire* emphasizes hauling ass in a helicopter gunship and firing at will. Within seconds of starting the game, you're in the pilot's seat of a chopper and charged with missions that usually have you converting your enemies' summer homes into small stacks of rubble and rescuing friendlies on the surface. Whether or not you enjoy the experience will depend entirely on your hardware. On most PDAs, controlling the chopper feels like bridling a giant housefly and riding it into the kitchen—*Hellfire* cries out for an external joypad with analog controls.

MAXIMUM PC VERDICT: 6

UNDEROOS: A fun simulation of a nice day in the country crushing your enemies.

ELDEROOS: PDA buttons just don't cut it for sharp maneuvering.

$20, www.astraware.com

Copyrighted material

Monarch Computer Systems

Visit www.monarchcomputer.com TODAY!

Buy Online or by phone:

1-800-611-0875

1-8-MONARCHPC

Paypal - Visa - Mastercard - Discover - AMEX

Monarch makes it quick and easy to upgrade with FREE setup and testing on Motherboard Combos and $18.00 build fee on Barebones.

AMD Solution Provider PLATINUM

AMD Sempron™ Combos

All Monarch Combos are Retail Box: Includes cables, manuals and drivers

Asus A7V880 KT880 Audio/GB-LAN/USB/SATA AMD Sempron™ processor 2400+ — Only $148

Abit NF7-S nForce2 (v.2) Audio/LAN/USB/IEEE AMD Sempron™ processor 2500+ — Only $170

Gigabyte 7N400PRO-2 nForce2 Audio/LAN/USB AMD Sempron™ processor 2600+ — Only $185

MSI K7N2 Delta-L nForce2 Audio/LAN/USB AMD Sempron™ processor 2800+ — Only $202

AMD Athlon™ 64 (754) Combos

All Combos have 6 month standard Monarch warranty (1, 2 and 3 year Monarch warranty options available)

Gigabyte GA-K8VM800M Audio/Video/LAN/USB AMD Athlon™ 64 processor 2800+ — Only $231

Asus K8V-SE Deluxe K8T800 Audio/SATA/USB AMD Athlon™ 64 processor 3000+ — Only $288

Abit KV8 PRO Audio/GB-LAN/USB/SATA AMD Athlon™ 64 processor 3400+ — Only $366

MSI K8T NEO-FIS2R K8T800 SATA/RAID/Audio AMD Athlon™ 64 processor 3700+ — Only $627

AMD Athlon™ 64/FX (939) Combos

Free installation, setup and testing by certified technicians

MSI K8N Neo2 Platinum Audio/GB-LAN/USB AMD Athlon™ 64 processor 3200+ (939 PIN - 90 nm) — Only $357

Abit AV8-3rd Eye K8T800 Audio/GB-LAN/USB AMD Athlon™ 64 processor 3500+ (939 PIN) — Only $488

Asus A8V Deluxe (v. 2.0) K8T800 AMD Athlon™ 64 processor 3700+ (939 PIN) — Only $722

Gigabyte K8NSNXP-939 Audio/GB-LAN/USB/IEEE AMD Athlon™ 64 FX-55 processor (939 PIN) — Only $1066

Components and Upgrades

1000s of In-Stock Components!
FREE SHIPPING on 100s of items!

AMD Processors

JUST RELEASED!
AMD Athlon™ 64 processor 3200+ 939 - 90 nm **$208.00**
AMD Athlon™ 64 processor 3000+ 939 - 90 nm **$173.00**

AMD Athlon™ 64 processor 3500+ 512K (939 PIN) **$347.00**
AMD Athlon™ 64 FX-55 processor (939 PIN) **$859.00**
AMD Athlon™ 64 processor 3700+ (939 PIN) **$629.00**
AMD Athlon™ 64 processor 3000+ 512K **$163.00**

150239
Western Digital 74 GB SATA 10K Raptor (WD740GD)
$176.00

150137
Western Digital 250 GB WD2500JB 7200 RPM 8MB IDE
$159.00

100673
Enermax Coolergiant EG485P-VHB 480W PS
$110.00

100073
Lian-Li PC-V1000 Aluminum Ultra Quiet w/No PS
$199.00

190029
ATI (Sapphire) Radeon X800 XT 256 MB DDR3/8X-AGP TV-Out/DVI
$555.00

190144
eVGA GeForce 6800 GT 256MB DDR3/AGP-8X TV-Out/DVIX
$405.00

190410
ATI (Gigabyte) X800 PRO 256MB DDR AGP 8X
$389.00

190436
BFG 6800Ultra-DVD256 nVIDIA GeForce 6800-ULTRA DDR3 256 MB AGP Bus Rate 4X 8X
$635.00

CORSAIR

Monarch Systems feature Award-winning Corsair Memory

140145
1 GB (2 pcs 512MB) DDR (400) PC-3200 Corsair w/LED Display (TWINX1024-3200XLPRO)
$289.00

140143
512 MB DDR (400) PC-3200 Corsair (CMX512-3200XLPT)
$136.00

New XL Series memory boots automatically using the Xtra-Low latency values of 2-2-2-5

Visit www.monarchcomputer.com for products in this ad, current inventory and up-to-the-minute pricing. Call or email for special orders

Educational and Government POs Welcome.

GSA Schedule Contract GS-35F-0202P

Commercial leasing available for purchases as low as $1000.

We ship to the Continental U.S., Alaska, Hawaii, APOs, Puerto Rico, and Canada

Prices subject to change without notice. Monarch Computer not responsible for typographical errors.

AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof, are trademarks of Advanced Micro Devices, Inc. All brands and product names are trademarks or registered trademarks of their respective companies. "QuantiSpeed™ architecture for exceptional software performance." Processor architecture operates at 2.0GHz AMD model numbers are a simple, accurate representation of relative AMD processor performance on industry-standard software benchmarks. Model numbers convey relative performance among different AMD processors to help you simplify your purchase decision.

Monarch Computer Systems

Visit www.monarchcomputer.com TODAY!

PayPal

Buy Online or by phone:
1-800-611-0875
1-8-MONARCHPC
Paypal - Visa - Mastercard - Discover - AMEX

AMD Sempron™ Barebone Systems

Lian-Li PC-V1000 Ultra Quiet Case
w/Wheels w/460W PS
Abit AN7 nForce2
AMD Sempron™ Processor 2400+
Starting @ $462

Antec Sonata Black Case w/380W PS
Asus A7N8X-E Deluxe nForce2
AMD Sempron™ processor 2500+
Starting @ $284

Enermax CS-800TA Mid-Tower (Yellow)
w/460W PS
Asus A7V880 KT880 Motherboard
AMD Sempron™ processor 2500+
Starting @ $298

Logisys Black Scorpio Mid-Tower Case
w/420W PS
Chaintech 7NIF2 NForce2
AMD Sempron™ processor 2600+
Starting @ $242

Monarch multimedia+ (Black) Tower
w/350W PS
Gigabyte 7N400PRO-2 nForce2
AMD Sempron™ processor 2600+
Starting @ $242

Mini Mid ATX USB Case
w/300W PS
MSI K7N2 Delta-L nForce2
AMD Sempron™ processor 2800+
Starting @ $269

AMD Athlon™ 64 (754) Barebone Systems

SliverStone SST-TJ06-B Tower Case
w/Wheels w/460W PS
Abit KV8 PRO
AMD Athlon™ 64 processor 2800+
Starting @ $493

Antec Performance One P160 ATX
Mid-Tower w/460W PS
Asus K8N-E Deluxe
AMD Athlon™ 64 processor 3000+
Starting @ $524

Maxdy (CSSWBKRE) Sidewinder
ATX Case w/450W PS
DFI K8M800-MLV K8M800
AMD Athlon™ 64 processor 3200+
Starting @ $368

Thermaltake VA3000SWA(S) Tsunami Tower
w/460W PS
Gigabyte GA-K8S760M
AMD Athlon™ 64 processor 3200+
Starting @ $509

Antec Super LANBoy Aluminum Mid Tower
w/460W PS
Asus K8V K8T800
AMD Athlon™ 64 processor 3400+
Starting @ $541

Thermaltake Modern Life Style
XaserV Series-Damier
w/420W PS
MSI K8T NEO-FIS2R K8T800
AMD Athlon™ 64 processor 3700+
Starting @ $824

***AMD Athlon 64 and Athlon 64 FX are the ONLY Windows®-compatible 64-bit PC processor

DON'T SEE WHAT YOU'RE LOOKING FOR HERE? WELL, WE HAVE IT! VISIT US ONLINE @ WWW.MONARCHCOMPUTER.COM

AMD Athlon™ 64/FX (939) Barebone Systems

Monarch Hornet w/Mustang Yellow Paint
w/350W (400W Peak) PS
Socket 939 u-ATX motherboard
AMD Athlon™ 64 FX-55 processor (939)
Starting @ $1439

Artec Guardian-S w/350W PS
Abit AV8-3rd Eye K8T800
AMD Athlon™ 64 processor 3500+ (939)
Starting @ $577

FoxConn Diabolic Series Gaming Case
w/400W PS
Asus A8V Deluxe (v. 2.0) K8T800
AMD Athlon™ 64 processor 3800+ (939)
Starting @ $900

Enermax CS-A666TA Mid-Tower
w/460W PS
Gigabyte K8NSNXP-939
AMD Athlon™ 64 processor 3000+
(939 - 512K - 90 nm)
Starting @ $484

Thermaltake VA3000SWA(B) Tsunami
Dream Tower w/460W PS
MSI K8T Neo2-F
AMD Athlon™ 64 processor 3500+ (939)
Starting @ $592

Logisys CS602RD Dracula Case
w/480W PS
MSI K8N Neo2 Platinum
AMD Athlon™ 64 FX-55 processor (939)
Starting @ $1065

Monarch Barebones available with the AMD Athlon 64 Processor:
Industry-leading performance today; ready for tomorrow's 64-bit software

***AMD Athlon 64 and Athlon 64 FX are the ONLY Windows®-compatible 64-bit PC processor

Get FarCry *FREE* by upgrading to AMD Athlon™ 64!

Get the Full Retail version of the Hit PC game Far Cry on DVD-ROM with any Athlon 64 Combo, Barebone, or System from Monarch Computer. This game is a $39.99 Retail value! Upgrade now to an AMD Athlon 64 bundle from Monarch and put that new hardware to the test with one of the hottest games available now, compliments of MonarchComputer.com and AMD!

Monitor, keyboard, mouse and speakers available seperately

Monarch GT64FX
(with AMD AthlonTM 64 FX-55!)
Custom PC

Part #: 800071

SELECTED COMPONENTS:
Thermaltake VA3000SWA(B) Tsunami Wave Case
Enermax EG465P-VE(FC) 460W PS
Asus SK8N nForce3 Motherboard
AMD Athlon™ 64 FX-55 CPU
512 MB DDR PC-2700 (333) Simpletech Memory
Maxtor 40 GB 7200 RPM HDD
THIS CONFIGURATION **IS ONLY $1432!**
Choose yourown configuration from 1000's of in-stock parts!

Accessores pictured above:
Monitor: 260123 CTX 17" S701BA LCD Flat Panel (Black) - $399.00

Keyboard/Mouse Combo: 220202 Logitech KB Premium Desktop Keyboard/Mouse Combo - $39.00

Speakers: 250327 Logitech X-220 Stereo PC Speakers - $33.00

Microsoft Windows XP Home - $89
Microsoft Windows XP Pro - $154

These and many other accessory options are available in our online configuration tool.

CUSTOM PCs - Easy as 1-2-3!

1. Log on to MonarchComputer.com, click "Custom Systems" and Choose your CPU.
2. Use our custom configuration tool to build your PC from 1000s of cutting edge, name-brand components.
3. Create and save your QUICK QUOTE & lock in your pricing for up to 7 days!

Build Fee of ONLY
$49.00 plus
selected components

IT TAKES 5 MINUTES OR LESS!

Monarch Custom PCs include: 48-72 hr. Burn-in Diagnostic Latest BIOS and Drivers - installed - All drivers included on CD - Clean installation including tie-off on all cables Final 62-point inspection by A+ Certified Techs - Free Unlimited Phone Support

HORNET PRO

<<< Visit www.monarchcomputer.com/hornet TODAY for more info!

MAXIMUM PC KICK ASS PRODUCT

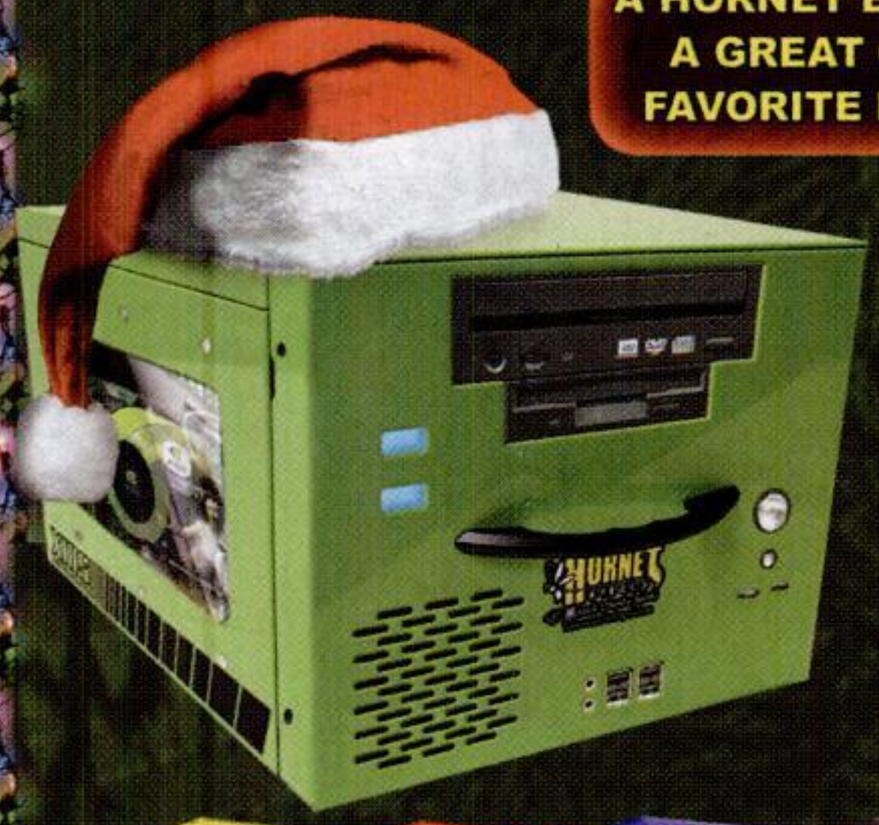
CPU COMPUTER POWER USER

Computer Games ★★★★★ Five of Five Stars

THE MOST POWERFUL & UPGRADABLE SFF SYSTEM AVAILABLE TODAY...

Tool-less construction - 400 Watt Peak Power Supply - FULL SIZE AGP Card - 3 PCI Slots - Removable Mainboard Tray - 2 Temp. Monitors - Detachable Handle - 2x3.5" (int), 1x3.5", 1x5.25" - 4 USB (2.0/1.1) and Audio In/Out on front - Whisper Quiet front and side fan w/optional rear fan. -Perfect for LAN parties & Clusters - Dimensions WxHxD: 11" x 9" (9.5" w/feet) x 13" - Designed to be lightweight and portable.

A HORNET BAREBONE MAKES A GREAT GIFT FOR YOUR FAVORITE PC ENTHUSIAST!



Hornet NexGen Sublime Green XMS Limited Edition Custom System

Only 100 signed & numbered units to be produced

A TRUE COLLECTOR'S ITEM!

Custom XMS Strobe Racing Stripe Decal on Clear Side Panels - Sublime Green Custom Paint with Matching Sublime Green Corsair XMS memory

THE HORNET PRO'S INSIDES ARE AS CUSTOMIZABLE AS ITS OUTSIDE! OUR ONLINE CONFIGURATION TOOL LETS YOU BUILD EXACTLY WHAT YOU WANT, FROM A SIMPLE BAREBONES TO A BLOWN-OUT SUPER-RIG! YOUR HORNET PRO IS JUST THAT - YOURS! YOUR SPECS, YOUR OPTIONS!

ORDER YOUR ONE-OF-A-KIND HORNET PRO TODAY!

NEW LOWER PRICE! Barebones Start @ ONLY $259!

AVAILABLE IN 5 CUSTOM COLORS!

AMD, the AMD Arrow logo, and combinations thereof, and the AMD64 logo, and AMD Opteron, are trademarks of Advanced Micro Devices, Inc.

$ 775

GAMER ULTRA 7000 ELITE

- Abit KV8 Pro Athlon™ 64 MB w/ 8X AGP
- Geil 512MB PC3200 DDR400 Memory
- 160GB 7200RPM 8MB Cache Serial ATA150 Hard Drive
- NVIDIA® Geforce™ FX 5700 8X AGP 256MB Video Powered by XFX
- LG 16X DVD-ROM
- LG 52X32X52 CD-RW Drive
- nForce 3 5.1 3-D Surround Sound
- 600Watt Subwoofer System
- 56K V.92 Modem & 1.44MB Floppy Drive
- Multimedia Control Internet Keyboard & Mouse
- **A-TOP X-BLADE Case 420Watt with See Through Windows**
- 6 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Microsoft® Work 7.0
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ 64 FX-53 Processor	$ 1579	CAH111
AMD Athlon™ 64 3800+ Processor	$ 1365	CAH112
AMD Athlon™ 64 3700+ Processor	$ 1165	CAH113
AMD Athlon™ 64 3500+ Processor	$ 1045	CAH114
AMD Athlon™ 64 3400+ Processor	$ 929	CAH115
AMD Athlon™ 64 3200+ Processor	$ 845	CAH116
AMD Athlon™ 64 3000+ Processor	$ 799	CAH117
AMD Athlon™ 64 2800+ Processor	$ 775	CAH118

$ 939

GAMER ULTRA 8000 DREAM

- Abit KV8 Pro Athlon™ 64 MB w/ 8X AGP
- Geil 512MB PC3200 DDR400 Memory
- 160GB 7200RPM 8MB Cache Serial ATA150 Hard Drive
- NVIDIA® Geforce™ 6600 8X AGP 256MB DDR w/ TV Out Powered by XFX
- LG 8X DVD+-RW Drive & LG 16X DVD-ROM
- nForce 3 5.1 3-D Surround Sound
- Creative Cambridge Desk Top Theater 5.1 S560 5.1 Surround Sound System
- 56K V.92 Modem & 1.44MB Floppy Drive
- Ideazon CrossFire Gaming Swapable Z-Board & Mouse
- **Nzxt® Aluminum X-Nemesis Tower Case 420Watt w/MOD "See Through Windows"**
- 5 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Microsoft® Work 7.0
- Free First Year On Site Service plus 24/7 Tech Support
- Upgrade to Sicuro RW670XL 5.1 Gaming Speakers System for $139

AMD Athlon™ 64 FX-53 Processor	$ 1745	CAG111
AMD Athlon™ 64 3800+ Processor	$ 1529	CAG112
AMD Athlon™ 64 3700+ Processor	$ 1335	CAG113
AMD Athlon™ 64 3500+ Processor	$ 1209	CAG114
AMD Athlon™ 64 3400+ Processor	$ 1099	CAG115
AMD Athlon™ 64 3200+ Processor	$ 1015	CAG116
AMD Athlon™ 64 3000+ Processor	$ 965	CAG117
AMD Athlon™ 64 2800+ Processor	$ 939	CAG118

$ 1465

GAMER ULTRA 9300 PRO

- Abit KV8 Pro Athlon™ 64 MB w/ 8X AGP
- Geil 1024MB PC3200 DDR400 Memory
- 200GB 7200RPM 8MB Cache Serial ATA150 Hard Drive
- NVIDIA® Geforce™ 6800 GT 256MB DDR3 w/ Full Version Doom 3 Game Powered by XFX
- 16X DVD+-RW Drive
- LG 16X DVD-ROM
- Creative Lab SB Audigy 2 ES 7.1 Sound w/ IEEE
- Creative Cambridge Inspire T7700 7.1 Surround Sound System
- 56K V.92 Modem & 1.44MB Floppy Drive
- Ideazon CrossFire Gaming Swapable Z-Board
- Microsoft® Optical intelli Explorer Mouse
- **Aluminum** X-Navigator Server Tower Case 425Watt w/ MOD "See Through Windows"
- 3 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Microsoft® Work 7.0
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ 64 FX-53 Processor	$ 2269	CAF111
AMD Athlon™ 64 3800+ Processor	$ 2055	CAF112
AMD Athlon™ 64 3700+ Processor	$ 1855	CAF113
AMD Athlon™ 64 3500+ Processor	$ 1735	CAF114
AMD Athlon™ 64 3400+ Processor	$ 1619	CAF115
AMD Athlon™ 64 3200+ Processor	$ 1535	CAF116
AMD Athlon™ 64 3000+ Processor	$ 1489	CAF117
AMD Athlon™ 64 2800+ Processor	$ 1465	CAF118

- **Provides leading-edge 32-bit performance for music, video, and games and is ready for future 64-bit software**
- **Improves security against certain types of viruses, with Enhanced Virus Protection for the upcoming Microsoft® Windows® XP SP2**
- **Conserves power and operates quietly with AMD Cool'n'Quiet™ technology**

Picture Shown w/ Optional Sicuro RW-670XL 5.1 Gaming Speaker System

CYBERPOWERINC.COM

AMD®, the AMD® Arrow logo, AMD® Athlon™, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

Copyrighted material

ORDER TOLL FREE [800]707-0393

$ 1089

GAMER ULTRA 5000 PRO

- Abit KV8 Pro Athlon™ 64 MB w/ 8X AGP
- Geil 1024MB PC3200 DDR400 Memory
- 160GB 7200RPM 8MB Cache Serial ATA150 Hard Drive
- NVIDIA® Geforce™ 6800 8X AGP 128MB DDR3 Video Card w/ TV Out & DVI Powered by XFX
- LG 8X DVD+-RW Drive
- LG 16X DVD-ROM
- nForce 3 5.1 3-D Surround Sound
- Creative Cambridge Desk Top Theater 5.1 SBS 560 5.1 Surround Sound Speakers
- 56K V.92 Modem & 1.44MB Floppy Drive
- Ideazon CrossFire Gaming Swapable Z-Board
- Microsoft® Optical wheel Mouse
- **Nzxt® Aluminum X-Nemesis Tower Case 420Watt w/MOD "See Through Windows"**
- 5 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Microsoft® Work 7.0
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ 64 FX-53 Processor	$ 1895	CAI111
AMD Athlon™ 64 3800+ Processor	$ 1675	CAI112
AMD Athlon™ 64 3700+ Processor	$ 1479	CAI113
AMD Athlon™ 64 3500+ Processor	$ 1359	CAI114
AMD Athlon™ 64 3400+ Processor	$ 1245	CAI115
AMD Athlon™ 64 3200+ Processor	$ 1159	CAI116
AMD Athlon™ 64 3000+ Processor	$ 1109	CAI117
AMD Athlon™ 64 2800+ Processor	$ 1089	CAI118

$ 565

GAMER ULTRA 5000 VALUE

- Abit KV8 Pro Athlon™ 64 MB w/ 8X AGP
- Geil 512MB PC3200 Dual Channel DDR400 Memory
- 160GB 7200RPM Hard Drive
- ATI® RADEON™ 9200 128MB DDR Video Card w/ TV Out & DVI
- LG Combo Drive (16X DVD-ROM & 52X32X52 CD-RW)
- nForce 3 5.1 3-D Surround Sound
- 600Watt Subwoofer System
- 1.44MB Floppy Drive
- Internet Keyboard & Mouse
- **Turbo X-Infinity Case 420 Watt with See Through Windows**
- 6 Cool Custom Colors to Choose From
- Free First Year On Site Service plus 24/7 Tech Support
- Upgrade to Sicuro RW360XL 2.1 Gaming Speakers System for $75

AMD Athlon™ 64 FX-53 Processor	$ 1355	CAJ111
AMD Athlon™ 64 3800+ Processor	$ 1145	CAJ112
AMD Athlon™ 64 3700+ Processor	$ 949	CAJ113
AMD Athlon™ 64 3500+ Processor	$ 829	CAJ114
AMD Athlon™ 64 3400+ Processor	$ 719	CAJ115
AMD Athlon™ 64 3200+ Processor	$ 635	CAJ116
AMD Athlon™ 64 3000+ Processor	$ 585	CAJ117
AMD Athlon™ 64 2800+ Processor	$ 565	CAJ118

$ 1465

GAMER XPLORER-64 9000

- **VIA K8T800 Chipset Motherboard**
- **1024MB PC3200 DDR400 Memory**
- 60GB Ultra ATA100 Hard Drive
- **Mobile ATI® Radeon™ 9700 PRO 128MB Video**
- 15.4" XGA TFT Display 1024x768 Pixels
- CD-RW/DVD Combo Drive
- 10/100 Network Card & 56K V.92 Modem
- Wireless 802.11G 54Mbps Networking
- 3-in-1 Built-in Media Reader
- 1 Firewire IEEE 1394 & 3 USB 2.0 Ports
- 1 PCMCIA Type II Slot
- Weight only 6.39 Lbs
- Microsoft® Windows® XP Home Edition
- Free Carrying Case
- 5 Custom Colors to Choose From

AMD Mobile Athlon™ 64 Processor 3700+	$ 1819
AMD Mobile Athlon™ 64 Processor 3400+	$ 1585
AMD Mobile Athlon™ 64 Processor 3200+	$ 1519
AMD Mobile Athlon™ 64 Processor 3000+	$ 1479
AMD Mobile Athlon™ 64 Processor 2800+	$ 1465

$ 565

GAMER X-TREME 8000

- Abit NF7 NVIDIA® nForce-2 400 Ultra MB with 8X AGP
- Geil 512MB PC3200 Dual Channel DDR400 Memory
- 80GB 7200RPM Ultra ATA133 Hard Drive
- ATI® RADEON™ 9200 128MB DDR Video Card w/ TV Out
- LG 16X DVD-ROM & LG 52X32X52 CD-RW Drive
- nForce 2 5.1 3-D Surround Sound
- 600Watt Stereo Subwoofer Speaker System w/ Matching Neon Light
- 56K Modem & 1.44MB Floppy Drive
- Internet Keyboard & Mouse
- **Turbo X-Infinity Case 420 Watt with See Through Windows**
- 6 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Microsoft® Work 7.0
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 3200+	$ 625	CL111
AMD Athlon™ XP Processor 3000+	$ 609	CL112
AMD Athlon™ XP Processor 2800+	$ 589	CL113
AMD Athlon™ XP Processor 2600+	$ 565	CL114

$ 1295

GAMER XPLORER-64 8000

- **VIA K8T800 Chipset Motherboard**
- **512MB PC3200 DDR400 Memory**
- 40GB Ultra ATA100 Hard Drive
- **Mobile ATI® Radeon™ 9700 PRO 128MB Video**
- 15.4" XGA TFT Display 1024x768 Pixels
- CD-RW/DVD Combo Drive
- 10/100 Network Card & 56K V.92 Modem
- Wireless 802.11G 54Mbps Networking
- 3-in-1 Built-in Media Reader
- 1 Firewire IEEE 1394 & 3 USB 2.0 Ports
- 1 PCMCIA Type II Slot
- Weight only 6.39 Lbs
- Free Carrying Case
- 5 Custom Colors to Choose From

AMD Mobile Athlon™ 64 Processor 3700+	$ 1649
AMD Mobile Athlon™ 64 Processor 3400+	$ 1415
AMD Mobile Athlon™ 64 Processor 3200+	$ 1349
AMD Mobile Athlon™ 64 Processor 3000+	$ 1309
AMD Mobile Athlon™ 64 Processor 2800+	$ 1295

AMD 64 Athlon FX

AMD 64 Athlon

The ONLY
Windows-compatible 64-bit
PC processor

- **Features HyperTransport™ technology for improved multitasking performance**

Life's Good

LG

CyberPower Inc.

4802 Little John St. Baldwin Park, CA 91706
Tel: (626)813-7730 • Fax: (626)813-3810
Technical Support (877)876-4965
Hour: Mon-Fri 8:30A.M. ~ 6:00P.M.
Sat 9:30A.M. ~ 3:00P.M.

All prices are subject to change without notice or obligation. CyberPower is not responsible for any typographical and photographic errors. Copyright © 2003 CyberPower. All rights reserved.

Copyrighted material

2005 International CES®

DEFINING TOMORROW'S TECHNOLOGY

PRODUCED BY CEA

THE HOTTEST TECHNOLOGY UNDER THE SUN.

Opportunity is coming to market. Featuring 130,000 potential partners, competitors and market makers. New products from 2,400 exhibitors. CES is the world's first look at the hottest technologies under the sun. Make the connections that will make your year, and watch your business grow. Register today at www.CESweb.org.

JANUARY 6-9, 2005 | LAS VEGAS

2005 International CES® | www.CESweb.org | **grow**

Copyrighted material

Introducing the world's first *unlimited*
Small Form Factor PC

It has over 500 Watts of power

Cools the fastest components on the planet

And it's about the size of a shoebox

Small Form Factor, Redefined

FragBox

By Falcon Northwest

NSIST ON NVIDIA®

1-888-FALCON-1
www.falcon-nw.com

Copyrighted material

Feel the Performance, Play to the Extreme !

925X/915P/915G PX Series Motherboard

Intel® 925X EXPRESS CHIPSET
- Dual Channel DDR Memory
- PCI Express® Graphics
- Intel® Matrix Storage Technology

Intel® 915P EXPRESS CHIPSET
- PCI Express® Graphics
- Intel® High Definition Audio
- Intel® Matrix Storage Technology

Intel® 915G EXPRESS CHIPSET
- Intel® Graphics Media Accelerator 900
- Intel® High Definition Audio

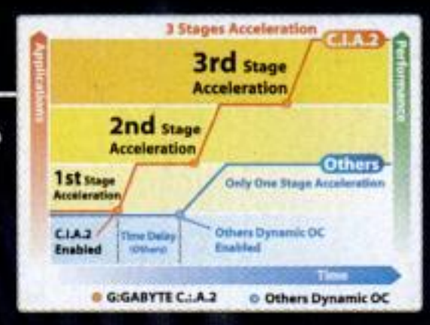
PX Turbo 3

C.I.A.2 CPU Intelligent Accelerator

CPU Intelligent Accelerator 2

The Most Intelligent Accelerator for your Machine

- Increase CPU performance faster
- 5 speeds each with 3 stages acceleration



M.I.B.2 Memory Intelligent Booster

Memory Intelligent Accelerator 2

Boost Your Memory Performance

- Increase memory performance up to 10%
- Optimized for both DDR and DDR2 memory

EASY TUNE 5

System Enhancement Tool

The Only Tool you need for Performance

- Easy to use for every user
- More Powerful, More Intelligent, Much Safer

PX Performance eXtreme Edition

Intel® LGA 775 Processor | PCI Express | Serial-ATA | Intel® High Definition Audio

GA-8ANXP-D

- Intel® 925X
- 8Σ Series
- U-Plus D.P.S
- Wireless LAN
- DDR2 533
- PCI-Express
- Dual Gigabit LAN
- IEEE 1394b
- Intel High Definition (HD) Audio

GA-81915G Pro

- Intel® 915G
- PX Series
- 2-CH DDR 400
- PCI-Express
- Gigabit LAN
- IEEE 1394
- Serial-ATA
- Intel High Definition (HD) Audio

GA-81PE775-G

- Intel® 865PE
- LGA 775
- 2-CH DDR 400
- Gigabit LAN
- Serial-ATA
- 8-Ch Audio

Available Through: *For other regional distributors, please contact G.B.T. INC (U.S.A.)*

ASI www.asipartner.com | BASS COMPUTERS, INC. www.basscomputers.com | D&H www.dandh.com | Fry's Outpost.com www.outpost.com | new egg www.newegg.com

LEADERTECH www.leadertech-chicago.com | WINTEC www.wintecind.com | MA★LABS www.malabs.com | SED INTERNATIONAL www.sedonline.com | SYNNEX www.synnex.com | Tech Data www.techdata.com

* These speed settings are not guaranteed by GIGABYTE.
-- The specification and pictures are subject to change without notice.
-- All trademarks and logos are the properties of their respective holders.
-- Any overclocking is at user's risk, Giga-Byte Technology shall not be responsible for any damage or instability to your processor, motherboard, or any other components.

Upgrade Your Life™ www.gigabyte.com.tw

GIGABYTE™ TECHNOLOGY

Copyrighted material

TMGcomputers.com

Founded by PC enthusiasts with a mission to deliver the best computers your money can buy. We carefully select each component and build a PC that's right for you. Each computer assembled at our facility undergoes a rigorous batch of tests before shipment. All cables are neatly tied together to assure a neat appearance, and maximum airflow in the case. When we build a computer for you that includes a DVD writer, it does not leave here before we burn a DVD with it. If it is a game PC, we make sure that it has the latest stable video drivers and all multimedia functionality is thoroughly tested. Each computer must pass a 24-hour high load burn in test. This assures that you will begin a worry free computing experience right out of the box. Every computer we sell is assembled here in the USA. Technical support is and always will be here in the USA.

the power gamer

- Intel® Pentium® 4 or AMD® Athlon64® CPU
- 1GB Corsair® DDR400 RAM
- ATI® Radeon™ X800Pro with 256MB DDR RAM
- Full Tower Case with Powerful 500Watt PSU
- Blue LED case fans and rounded cables!
- 400GB HD 2x200GB 7200RPM 8MB SATA RAID
- 8x DVD±R/RW & CDRW Dual Layer DVDR
- 16x DVD & 52x24x52x CDRW Combo Drive
- Creative Labs® Audigy2™ ZS
- Integrated Gigabit LAN & 56K V.92 Modem
- 7-in-1 Media Card Reader & 1.44MB Floppy
- Microsoft® Keyboard and Optical Mouse
- Microsoft® Windows® XP Home, SP2
- Microsoft® Works Suite 2004
- T7700 7.1 Speaker System (add $129)
- 17" LCD (add $499) 15" LCD (add $359)

Intel P4 CPU @ 3.0 GHz **$1969** AMD Athlon 64 3500+ CPU **$2159**
Intel P4 CPU @ 3.2 GHz **$1999** AMD Athlon 64 3800+ CPU **$2479**
Intel P4 CPU @ 3.4 GHz (LGA 775) **$2099** AMD Athlon 64 FX-53 CPU **$2759**

the mini gamer

- AMD® Athlon® 64 CPU 64-Bit Power!
- 512MB Corsair® DDR400 RAM
- ATI® Radeon™ X800Pro with 256MB DDR RAM
- ALUMINUM Windowed Case with 400Watt PSU
- Blue LED case fans and rounded cables!
- 160GB HD 2x80GB 7200RPM 8MB SATA RAID
- 8x DVD±R/RW & CDRW Dual Layer DVDR
- Creative Labs® Audigy™ ES
- Gigabit LAN/56K V.92 Modem/Floppy
- Microsoft® Keyboard and Optical Mouse
- Microsoft® Windows® XP Home, SP2
- Z-640 5.1 Speaker System (add $59)
- T7700 7.1 Speaker System (add $129)
- 17" LCD (add $499) 15" LCD (add $359)

AMD Athlon 64 3000+ Processor.....$1489
AMD Athlon 64 3200+ Processor.....$1539
AMD Athlon 64 3400+ Processor.....$1619

the multimedia powerhouse

- Intel® Pentium® 4 800Mhz FSB, 1MB Cache, HT CPU
- 512MB DDR400 RAM
- NVIDIA® GeForce™ FX5700LE, 256MB DDR RAM, TV Out & DVI
- Mid Tower Case with 350Watt PSU
- 160GB 7200RPM SATA Hard Drive
- 8x DVD±R/RW DVD Writer
- Integrated Gigabit LAN & 56K V.92 Modem
- 7-in-1 Media Card Reader & 1.44MB Floppy
- Microsoft® Keyboard and Optical Mouse
- Microsoft® Windows® XP Home, SP2
- Microsoft® Works Suite 2004
- Z-640 5.1 Speaker System (add $59)
- 17" LCD (add $499) 15" LCD (add $359)

Intel Pentium 4 Processor @ 3.0 GHz $1139
Intel Pentium 4 Processor @ 3.2 GHz $1189
Intel Pentium 4 CPU @ 3.4 GHz (LGA 775) ...$1269

the small office PC

- Intel® Pentium® 4 800Mhz FSB, 1MB Cache, HT CPU
- 256MB DDR400 RAM
- ATI® Radeon™ 9200SE 128MB
- Mid Tower Case with 350Watt PSU
- 120GB 7200RPM Hard Drive
- 16x DVD & 52x24x52x CDRW Combo Drive
- Integrated 10/100 LAN & 56K V.92 Modem
- 1.44MB Floppy & Stereo Speakers
- Multimedia Keyboard and Mouse
- Microsoft® Windows® XP Home, SP2
- Microsoft® Works 8.0 – Productivity Tools
- 17" LCD (add $499) 15" LCD (add $359)

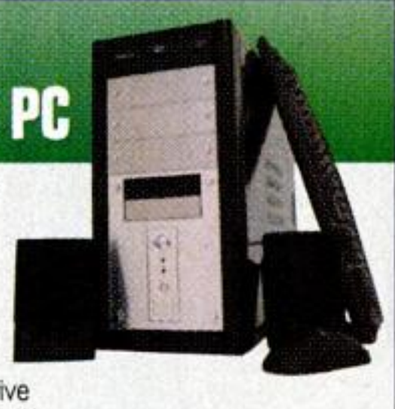
Intel Pentium 4 Processor @ 2.8 GHz $849
Intel Pentium 4 Processor @ 3.0 GHz $879
Intel Pentium 4 Processor @ 3.2 GHz $929

the value PC

- AMD® Athlon™XP CPU
- 256MB DDR400 RAM
- NVIDIA® GeForce™ MX4000, 64MB RAM
- Black Mid Tower Case
- 80GB 7200RPM Hard Drive
- 16x DVD & 52x24x52x CDRW Combo Drive
- Integrated 10/100 LAN & 56K V.92 Modem
- 1.44MB Floppy & Stereo Speakers
- Multimedia Keyboard and Mouse
- Microsoft® Windows® XP Home, SP2
- Microsoft® Works 8.0 – Productivity Tools
- 17" LCD (add $499) 15" LCD (add $359)

AMD Athlon XP 2500+.....$659
AMD Athlon XP 2800+.....$709
AMD Athlon XP 3000+.....$739

the ultra value PC



- AMD® Athlon™XP CPU
- 256MB RAM
- Integrated Video
- Black Mid Tower Case
- 80GB 7200RPM Hard Drive
- CD Optical Drive
- Integrated LAN & 56K V.92 Modem
- 1.44MB Floppy & Stereo Speakers
- Multimedia Keyboard and Mouse
- Microsoft® Windows® XP Home, SP2
- 17" CRT Monitor add $165

AMD Athlon XP 2000+.....$495
AMD Athlon XP 2200+.....$505
AMD Athlon XP 2500+.....$519

TMG

866-TMG-4APC

Tel. Sales 866-TMG-4APC "TMG for a PC"
Tech. Support 631-261-1620
www.tmg4apc.com or www.tmgcomputers.com

For the latest deals, visit us online at:

www.TMGcomputers.com

225 Main Street, Suite 206, Northport, NY 11768

©2004 TMG Computers, Inc. All rights reserved. Pricing, specifications, and availability subject to change without notice. Some systems may show optional equipment. Due to component availability, product may differ slightly from photographs. Not responsible for typographical or photographic errors. All trademarks property of their respective owners. Return policy is 30 days from system ship date with an RMA number. Opened software is not returnable. LCD monitors are returnable for exchange only, if defective. Returns will not be authorized for damaged or incomplete items. All returns must be in resalable condition in original packaging with all manuals. Customer responsible for return shipping costs. Shipping charges are not refundable. No refunds will be given after 30 days. Terms and conditions subject to change without notice.

Copyrighted material

XG EXTREME GAMER®

THE FUTURE OF GAMING IS HERE

dragon VIPER QUANTUM SIDEWINDER NINJA

WWW.XGBOX.COM

AMAX ISO-9001 Registered · ASI · COMPUSA.com WHERE AMERICA BUYS TECHNOLOGY · Fry's ELECTRONICS · INGRAM MICRO LATIN AMERICA · MA LABS One-stop PC Component Supplier · MICRO CENTER The Ultimate Computer Store · PC CLUB

Manufactured by MGE www.mge-usa.com

www.amax.com, www.asipartner.com, www.ingrammicro.com, www.malabs.com, www.compusa.com, www.outpost.com, www.microcenter.com, www.pcclub.com

MGE® LOGO is a registered trademark of the MGE® Company. All rights reserved.

Copyrighted material

www.infotechnow.com

INFOTECHNOW.COM

1-877-51-ORDER (67337)

*"Serving innovation for over **9 years**."*

CPU Liquid Cooling

Video Card Liquid Cooling

Hard Drive Liquid Cooling

Bring powerful liquid cooling technology to an existing computer! The Koolance Exos is the worldís most famous external PC liquid cooling system.

Exos-AI

Exos

(System monitors sold Separately.)

HOME PC 2.4

- **2.4G Intel P-4 (533FSB)**
- Asus P4VP-MX Motherboard
- 256GB PC-2100 Memory
- Western Digital 40G Hard Drive
- VIA AGP 4X Video
- 6-Channel Audio
- **Samsung CDRW Drive**
- Infotech 2-pcs Speakers
- Mitsumi Keyboard, Mouse
- 10/100 Fast Ethernet
- ATX (Mid) Case
- MS Windows XP Home

$539.99

EXTREME 64

- **AMD Athlon 64 2800+**
- Asus K8VSE DLX Motherboard
- **Antec 3700 BQE Case**
- 512M PC-3200 Memory
- Western Digital 80G (8M) HD
- Asus GeForce FX5200 128M Video
- 6-Channel Audio
- **NEC DVD+-RW 8X Black**
- **Logitech X-220 Speakers**
- Logitech Optical Mouse, Keyb.
- 10/100 Fast Ethernet, optional Wi-Fi
- MS Windows XP Home

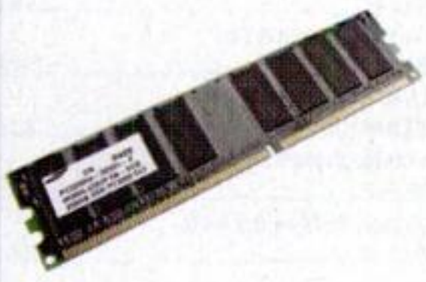
$929.99

TRINITY

- **3.2G Intel P-4 (800FSB, 1M)**
- MSI 915P Neo2 Motherboard
- **Lian-Li PC-V1000B Aluminum Case**
- **1G PC-3200 Memory**
- **Western Digital Raptor 74G HD**
- **MSI RX600XT 128M Video**
- **Pioneer 8X DVD+-RW, Black**
- **Creative Inspire 7.1 T7700 Speakers**
- 8-Channel Audio
- Gigabit Ethernet
- Aopen Wireless Keyboard, Mouse
- Fortron 530W Power
- MS Windows XP Home

$1899.99

HOT



PC-3200 512M
DDR 400 (OEM)
$79.99

Maxtor 6Y200P0
200GB IDE (OEM)
$119.99

Gigabyte 7NNXP
AMD AthlonXP
$157.99

Creative SB-Live!
5.1-Channel (OEM)
$27.99

Asus V9400 Magic
MX4000 128M (Retail)
$57.99

Intel P-4 3.0G 800FSB
1M Cache (Retail)
$199.99

sales@infotechnow.com Open Mon-Fri 9am-7pm PST, Sat 9am-6pm PST 1-877-516-7337

Trademarks are the property of their respective owners. Prices and availability are subject to change without notice. Always check store for the latest pricing. Infotech Systems, Inc. is not responsible for typographical or graphical errors.
Product images are for representation only and may differ from actual product. *Microsoft OEM hardware requires core hardware (CPU, MB, or RAM) purchase. Ad for period October-November 2004.

Copyrighted material

SVC

SILICON VALLEY COMPUCYCLE

cool PRODUCTS HOT PRICES

www.svc.com

SVC IS PROUD TO OFFER THE FULL LINE OF COOLER MASTER PRODUCTS!

COOLER MASTER REAL POWER 450W POWER SUPPLY W/POWER CONSUMPTION METER $89.99

Cooler Master is racing to meet the demands of reliable, stable and ultra-silent power with the REAL POWER 450W. It offers high octane performance you can really SEE with the innovative analog dial that mounts right on the front panel of your machine. Blast down the Information Superhighway, spin those high RPM hard drives, crank up those cooling fans, turn on the lights and turn up the sounds - you can see REAL POWER has more power. The award winning team at Cooler Master now gives you continuous power + reliable power + quiet power + smart power = REAL POWER.

UV REACTIVE CABLE SLEEVING KIT $5.99

Dress up your computer case and reduce clutter! This braided sleeving kit is an inexpensive way to keep your cables organized and give your computer a cleaner look. Available in black, blue, red, and green.

C3 LASER CUT UV ACRYLIC CASE $199.99

This all acrylic case comes completely assembled and the laser cut parts are all UV Sensitive. The precision fit and finish allow easy installation of drives and devices and the double boxed package ensures safe shipment. Visit www.svc.com to see our wide selection of UV reactive parts.

COOLER MASTER UV FANS $4.99

Blue, Purple, Red, Orange, & Green

Available in 80mm and 120mm

UV Reactive Fans have been available in orange, green, and blue but Cooler Master is the first to produce five different colors which actually light up the correct color under a black light. High transparency, bright colors, a single flexible power cable, and ultrasilent operation make this the best UV fan available. See these and over 30 other Cooler Master case fans at SVC.com!

ONE TOUCH STACKABLE CD FILE BOX - $15.99 AVAILABLE IN 11 COLORS

Organize your CDs as you would papers in a file cabinet. At the touch of a button, the loaded drawer glides out for easy access. Use the supplied labels to classify your CDs for quick reference. The weighted box is stable even when the drawer is loaded and fully extended. The stackable design allows your storage space to grow with your CD collection. Visit our website for this and other innovative media storage solutions.

12" SUPER BRIGHT COLD CATHODE LIGHTING KITS - $4.99

Our CCFL kits all feature ultra high brightness (29,000cd/m2), a 30,000 hour lifetime, low heat output, and low power consumption. Visit www.svc.com to see our full line up of over 100 different CCFL, LED, and EL lighting products. Starting at ONLY $4.99!

SVC 100CC 4-STROKE DIRT BIKE JUST $799!

This powerful dirt bike is equipped with a 100cc Four-Stoke engine capable of top speeds up to 70mph! A semi-automatic transmission gives the rider the ability to switch from neutral to 3 different gears with the pedal shifter. Front hydraulic disk brake and pedal controlled rear drum brake gives the rider full control of the bike. Details include: Electric and kick start, full front and rear suspension, large off road tires, and a fiber-glass body.

49CC X2 SUPER POCKET BIKE W/ALARM AND CVT - $499

This bike is crafted with precision, performance, and function-ality in mind and is not your typical toy bike. The painted fiber-glass body is designed to give the bike the look and feel of a real racing motorcycle while minimizing the overall weight of the bike. Fully functional front headlights and taillights, turn signals, horn, and speedometer gives the bike a more authentic look. The body is beautifully painted and finished to give a mirror-like shine. The CVT transmission provides far less vibration than the direct drive system on the XI and the alarm deters theft. Up to 250lb rider weight and top speeds of 30-40mph!

MINI-MOTO HALF FAIRING POCKET BIKE - SILVER

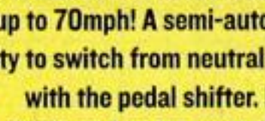
$299 W/FREE SHIPPING

This mini-pocket bike uses a single-cylinder two-stroke engine. At 47cc's it is pushing plenty of power to drive the lightweight, 41.5lbs bike up to speeds of 25-40mph. Power is transferred to the rear wheel through a drive chain. A centrifugal friction clutch drives the power form the motor to the drive train. The Mini-Moto is small and has the most extreme rider position, but rewards the rider with the best overall performance and a low price tag.

Cable Adapters

3-Pin to 4-Pin Adapter	$0.50
Dual 3-Pin to 4-Pin Adapter	$0.99
3-Pin to 4-Pin Adapter w/ RPM	$0.99
12" 3-Pin to 3-Pin Extension	$0.99
3-Pin Y-Adapter	$0.75
4-Pin to 3-Pin Adapter	$0.99
4-Pin Power Supply Molex Y-Adapter	$0.50

Round Cables

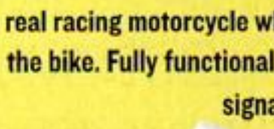


Single Device 10" Floppy Cables	$1.15/ea
Single Device 18" Floppy Cables	$1.25/ea
Single Device 24" Floppy Cables	$1.45/ea
Single Device 10" IDE Cables	$1.75/ea
Single Device 18" IDE Cables	$2.00/ea
Dual Device 18" IDE Cables	$2.10/ea
Dual Device 24" IDE Cables	$2.40/ea
Dual Device 36" IDE Cables	$3.35/ea

Lighting

Super Bright 12" Dual Tube CCFL Kits	$5.99
Logisys 12" Dual Tube CCFL Kits	$5.49
12" Multi LED Meteor Lights	$9.99
Logisys 12" Meteor LED Light Kits	$11.99
3 Lazer LED Clusters	$2.79

Screws



Black/Silver Fan Screws	$0.07/ea
Black/Silver Thumb Screws	$0.25/ea

Cooling

Arctic Cooling VGA Silencer Rev. 3	$14.99
Arctic Silver 5 Thermal Compound	$5.99
Cooler Master Ultra Vortex CPU Cooler	$28.99
Thermalright XP-120 CPU Cooler	$49.95
Thermalright XP-90 CPU Cooler	$37.99
Thermaltake Tower112 Copper CPU cooler	$45.99
OCZ Copper BGA / Chipset Ramsinks	$13.99
Zalman ZM80HD-HP Fanless VGA Cooler	$31.99

Fans

80x25mm Panaflo Hyrdo 12L 3-Pin 24.0CFM/21.0dB	$6.99
80x25mm Sunon Ball Bearing 4-pin 39.0CFM/32.0dB	$4.99
80x25mm SVC Ball Bearing 3-pin 32.5CFM/28.3dB	$1.65
80x25mm SVC Ball Bearing 4-pin 32.5CFM/28.3dB	$2.49
80x38mm Vantec Tornado 4-pin 84.1CFM/55.2dB	$12.95
92x25mm Enermax Variable 3-Pin 64.2CFM/34.3dB	$11.99
92x25mm SVC Ball Bearing 3-Pin 44.5CFM/32.1dB	$3.95
92x25mm Sunon Ball Bearing 4-Pin 49.0CFM/34.5dB	$6.99
92x38mm Vantec Tornado 4-Pin 119.0CFM/56.4dB	$13.99
120x25mm SVC Double Ball 4-Pin 98.0CFM/43.0dB	$9.99
120x25mm Vantec Stealth 3-Pin 53.0CFM/28.0dB	$14.99
120x25mm Sunon Ball Bearing 4-Pin 90.0CFM/44.5dB	$14.49

We recommend safety gear to be worn at all times of use

Please check local laws and regulations regarding street use

WWW.SVC.COM

Copyrighted material

KICKASS GAMING PC

WWW.KICKASSGAMINGPC.COM

877-GAME-PC 1 (426-3721)

VIDEOS, MUSIC, PHOTOS - WHEN AND WHERE YOU WANT!

Get CREATIVE

Watch up to 85 hours of Movies, Recorded TV Programs or Home Videos with Creative Zen. $469

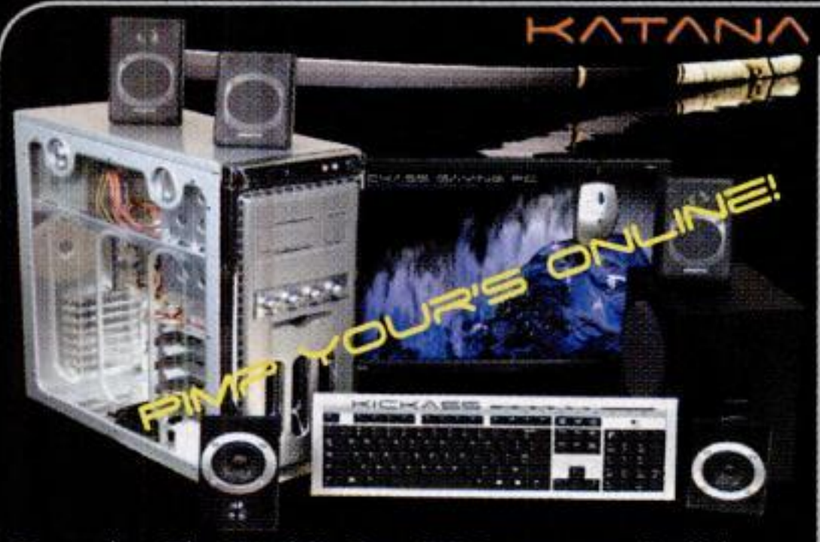
SEAGATE NCQ SATA!

Special Edition:Barracuda 7200.7 160GB, 7200rpm, 8mb Cache SATA with NATIVE COMMAND QUEING (NCQ) PERFORMANCE w/5 year Warranty

FASTEST SATA DRIVE PERIOD

$129

KATANA

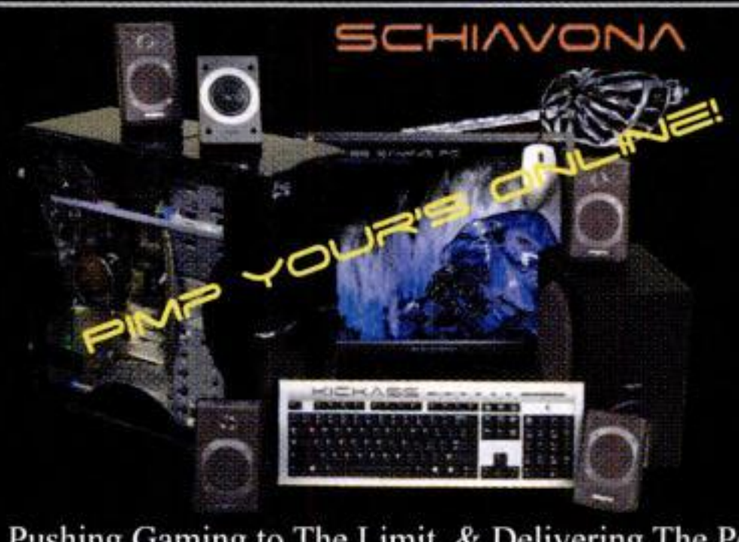


Featuring The World's Best PC Processor. Stylish, Clean. Specially Tweaked For Big Performance For Gamers By Gamers! This Is Not Your Daddy's Ole' Computer, This One Kicks ASS! Anyone's.

*Antec Performance One P160 w/Side Window
*Ultra-X-Connect Power Supply 500 Watt Silver
*AMD Athlon™ 64 FX-53 with HyperTransport
*Asus A8V Deluxe Motherboard Socket 939
*Corsair 2GB 2-2-2-5 Dual DDR Memory
*Seagate 320GB RAID 0, 8MB 7200.7 SATA
*Gainward FX 6800 Golden Sample 256MB
*7.1 Hollywood@Home™ Sound System
*16X Double Layer DVD -/+R Recorder

PIMPED@$3299

SCHIAVONA

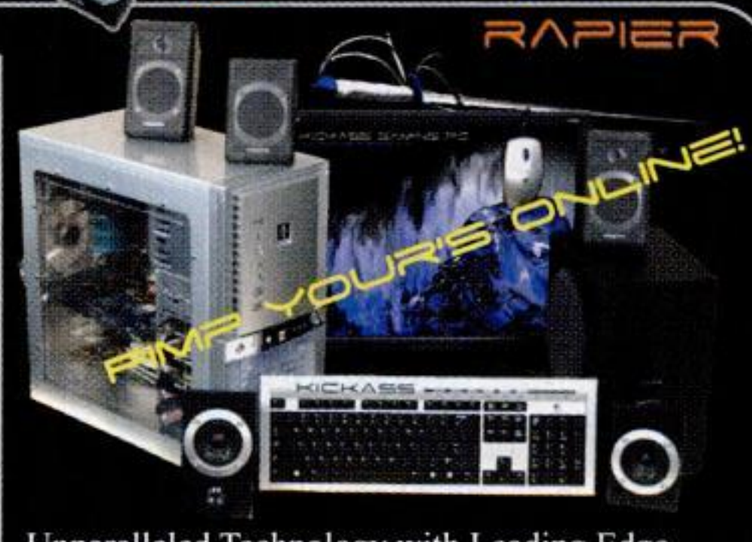


Pushing Gaming to The Limit, & Delivering The Performance, Quality, and Reliability Worthy of a KickAss System. This System is For The Passionate Gamer and The Power User.

*ThermalTake Tsunami Black Clear Window Case
*Ultra X-Connect 500W ATX PS with UV Cable Kit
*Intel® Pentium® 4 processor 550 3.4Ghz 1MB
*Asus P5AD2 Premium Motherboard Wireless Edition
*PC2-4300 DDR 2 Dual Channel 1024MB Kit
*PCI-Express FX6600 256MB
*7.1 Channel High Definition Dolby Audio
*500GB RAID 0, 8MB 7200 RPM Serial ATA
*16X/48X CD/DVD Internal IDE Drive
*52X32X52 CD-RW Internal IDE Drive
*Microsoft Windows XP Professional

PIMPED@$2299

RAPIER



Unparalleled Technology with Leading Edge Performance. Optimized For Intense Gaming & Amazing Digital Media, Oh Yeah! It Kicks ASS!

*Antec Super LanBoy With Side Window
*Ultra X-Connect 500 Watt Silver Satin P.S.
*Intel 3.2E GHz Intel Pentium 4 HT Processor
*Asus P4C800-E Deluxe Motherboard
*OCZ PC-4000 EL Dual Channel 1GB Memory
*200GB 8MB, 7200RPM Serial ATA Hard Drive
*FX 6800 GT 256MB DDR 3 OverClocked
*Gainward Hollywood@Home™ 7.1 SoundCard
*52x32x52x CD-RW Internal IDE Drive
*16X DVD, 48X CD-Rom Internal IDE Drive
*Microsoft Windows XP Home Edition

PIMPED@$1899

PROCESSORS

INTEL

Socket 478					
Asus	P4R800V/D	$89/109	P4P800SE/ED	$115/130	
	P4C800D/ED	$180	P4P800MX	$85	
Intel	D875PBZLK	$169	D865PERLX	$110	
MSI	MS-6728	$92	865PENEO2PFISR	$139	
	865PENEO2PLS	$83	865PENEO2V	$85	
Socket T (LGA 775)					
Asus	P5AD2P/D	$279/249	P5GD2-P/D	$255/225	
Intel	D915PBLL/PCML	$175/125	D925XCLK/VLK	$219	
MSI	915NEO2PLAT	$179	925XNEOPLAT	$219	
	915GCOMBOFR	$159	915PCCOMBOFR	$149	

AMD

Socket A				
Asus	A7N8X/ED	$89/109	A7V8X/X	$95/65
	A7V400MX	$65	A7V600	$85
Socket 754				
Asus	K8VSE-DELUXE	$139	K8N-E DELUXE	$145
Socket 939 (64 Bit)				
Asus	A8VDX/WIFIG	$139/169	Abit AV8	$130
MSI	K8NNEO2PLAT	$155	MSI K8TNEO2FIR	$139

INTEL

Socket 478					
2.8GHz	BX80546PG2800E	$199	2.5GHz	BX80546RE2533C	$90
3.0GHz	BX80546PG3000E	$209	2.6GHz	BX80546RE2667C	$95
3.2GHz	BX80546PG3200E	$245	2.8GHz	BX80546RE2800C	$115
3.4GHz	BX80532PG3400D	$339	2.9GHz	BX80546RE2933C	$135
Socket T (LGA 775)					
2.8GHz -520	1MB	$189	3.4GHz-550	1MB	$309
3.0GHz -530	1MB	$199	3.6GHz-560	1MB	$469
3.2GHz -540	1MB	$249			

AMD

Socket 754					
A64 3000+	ADA3000AX	$179	A64 3400+	ADA3400AX	$309
A64 3200+	ADA3200AX	$219	A64 3700+	ADA3700BOX	$549
Socket 939					
A64 3500+	ADA3500AW	$379	A64 FX-53	ADAFX53BOX	$895
A64 3800+	ADA3800AW	$689			

*WE CARRY ZALMAN, THERMALTAKE & COOLERMASTER FAN & HEATSINK

MEMORY

DUAL DDR MEMORY

OCZ2533512VDC-K	PC2-4200 512MB DUAL DDR2 KIT 533MHz	$189
OCZ25331024VDC-K	PC2-4200 1GB DUAL DDR2 KIT 533MHz	$359
OCZ25332048VDC-K	PC2-4200 2GB DUAL DDR2 KIT 533MHz	$729
TWIN2X1024-5400XLP	PC-5400 DDR2 PRO 1GB W/LED 667MHz	$429
TWINX1024-3200XLP	PC-3200 PRO 2-2-2-5- 1GB XMS3200	$349

KICKASS CASE

$119
Antec Neo480

$89.00ea & In Many Colors

HARDDRIVES

Maxtor	120GB	7200rpm	SATA	6Y120M0	$99
Maxtor	160GB	7200rpm	ATA 133	6Y160P0	$99
Maxtor	160GB	7200rpm	SATA	6Y160M0	$115
Maxtor	250GB	5400rpm	ATA 133	5A250J0	$209
Maxtor	300GB	7200rpm	SATA	6B300S0	$265
Seagate	120GB	7200rpm	ATA 133	ST3120026A	$99
Seagate	160GB	7200rpm	SATA	ST3160827AS	$129
Seagate	200GB	7200rpm	SATA	ST3200822A/AS	$129/139
WD	120GB	7200rpm	ATA/SATA	WD1200JB/JD	$99/$109
WD	200GB	7200rpm	ATA/SATA	WD2000BB/JB	$125/$135
WD	250GB	7200rpm	ATA/SATA	WD2500JB/JD	$205/$215
WD	250GB	7200rpm	ATA/SATA	WD2500SB/SD	$225/$235
WD	36GB	10000rpm	SATA	WD360GD	$139
WD	74GB	10000rpm	SATA	WD740GD	$209
Hitachi	160GB	7200rpm	SATA	13G0254	$115
Hitachi	250GB	7200rpm	SATA	13G0255	$205
Hitachi	400GB	7200rpm	SATA	0A30229	$425

VIDEO CARDS

ATI

Asus	Radeon X800Pro	$509	MSI	Radeon X800Pro	$479
ATI	Radeon X800Pro	$449	Visiontek	Radeon X800Pro	$429
ATI	Radeon X800XT	$559	Gigabyte	Radeon X600XT	$219
Celestica	Radeon X800XT	$559	MSI	Radeon X600Pro	$179
Celestica	Radeon X800Pro	$449	Celestica	Radeon X600XT	$249

NVIDIA

EVGA	PCX6600 PCI-E	$229	BFG	6800 GT 256MB	$449
Gainward	PCX6600 PCI-E	$219	EVGA	6800 GT 256MB	$449
Gainward	PCX6800 PCI-E GT	$479	Gainward	6800 GT 256MB G.S	$439
Gigabyte	PCX6600 PCI-E	$229	Gainward	6800 GT Ultra G.S.	$549
Gigabyte	PCX6800 PCI-E GT	$489	MSI	6800 ULTRA 256MB	$619
MSI	PCX6600 PCI-E	$239	PNY	6800 GT 256MB	$449

CREATIVE LABS

Wildcat	VP0990 Pro 512mb	$579	Wildcat	4 7110 128MB	$1119
Wildcat	Realizm 200 512mb	$1169	Wildcat	4 7210 128MB	$1819

PC GAMES

Activision	Doom 3	$54.99
Activision	Call of Duty	$39.99
Activision	Empires-Dawn/Modern	$29.99
Atari	Unreal Tournament	$39.99
Microsoft	Halo 2	$49.99

MONITORS

NEC	19"	FE990BK	1792x1344	$249
NEC	19"	FE991SB	1792x1344	$279
NEC	21"	AS120-BK	1792x1344	$459
NEC	22"	DP2070SB	2048x1536	$709
NEC	22"	FE2111SB	2048x1440	$609
V'SONIC	19"	E90FB	1600x1200	$239
V'SONIC	19"	P95F+B-2	1600x1200	$269
V'SONIC	22"	P220FB-3	2048x1536	$589
V'SONIC	22"	P225FB-5	2048x1536	$639
V'SONIC	21"	VP211B	1600x1200	$1419

SOUND CARDS

Creative	Audigy 2 ZS	$89
Creative	Audigy 2 ZS Gamer	$119
Creative	Audigy 2 ZS Platinum	$179
Creative	Audigy 2 ZS Platinum Pro	$229
Gainward	Hollywood@Home™ 7.1	$39

SPEAKERS

Creative	Inspire T7700 7.1 Surround	$89
Creative	Inspire 5.1 5500 Digital	$169
Creative	GigaWorks S750 7.1 Surround	$429
RWTI	5.1 Gaming Speaker Blue/Green/SLV	$189
Logitech	ProLogic II 5.1 Z680	$239

WATER COOLER

Coolermaster	Liquid Cooling Aquagate	$199
Kingwin	Liquid Cooling Arctic	$109
Thermaltake	Liquid Cooling A1604	$109
Thermaltake	Liquid Cooling A1681	$229
Zalman	Liquid Cooling Reserator1	$219

1635 Broadway Ste#109 • Pearland, TX 77581 • Local (281)482-2031 • Store Hours: Mon-Fri 8am-7pm CST, Sat 9-4pm

Copyright 2004 KickAssGamingPC.com All rights reserved. KickAssGamingPC.com is not responsible for typographical errors. All typographical errors are subject to correction. Prices, specifications and availability are subject to change without notice. Shipping charges are non refundable. Returns are subject to a restocking fee. Products are covered by manufactures warranty only. We accept government and educational P.O.

Copyrighted material

Xpider II

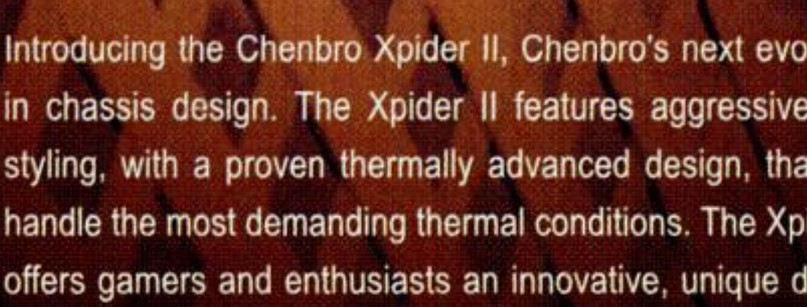
By Gamers, For Gamers

Powering the Gamer's Dream Machine

- Aggressive Styling
- Proven Thermal Design
- Screwless Assembly
- Innovative See-Through Side Panel
- Intel Prescott™ & AMD Athlon 64/FX Ready

Introducing the Chenbro Xpider II, Chenbro's next evolution in chassis design. The Xpider II features aggressive new styling, with a proven thermally advanced design, that can handle the most demanding thermal conditions. The Xpider II offers gamers and enthusiasts an innovative, unique design coupled with support for the latest CPUs including the new Intel Prescott and AMD Athlon 64/FX series. Gamers and PC enthusiasts seeking the ultimate gaming system will be attracted to Xpider II's configuration flexibility and innovative design at a price that will not break the bank. See the new Xpider II at your authorized Chenbro dealer.

Color Options



Red Blue White Green

Global ID Patent Pending

CHENBRO

www.chenbro.com

Chenbro Micom (USA) Inc.
Tel: 909-947-3200 Fax: 909-947-4300 E-mail: info@chenbro.com

Copyrighted material

ABS® Recommends Microsoft® Windows® XP

- Provides leading-edge 32-bit performance for music, video, and games and is ready for future 64-bit software
- Improves security against certain types of viruses, with Enhanced Virus Protection for Microsoft® Windows® XP SP2
- Conserves power and operates quietly with AMD Cool'n'Quiet™ technology

THE ONLY MICROSOFT® WINDOWS® - COMPATIBLE 64-BIT PC PROCESSOR AVAILABLE TODAY

UNREAL PERFORMANCE

PC World Best Buy, May 2004

ABS® Ultimate M5^{64}

AMD Athlon™ 64 Socket 939 3500+ Processor with HyperTransport™ Technology*
Up To 2000MHz System Bus

The ONLY Windows-compatible 64-bit PC processor

Microsoft® Windows® XP Home Edition

Cooler Master CAV-T01-WWA Case w/Side Panel & Sound Pressure Device

Antec True 480W Power Supply

ASUS A8V Deluxe Motherboard w/Gigabit LAN & IEEE 1394

Free Upgrade to Corsair XMS 1024 MB PC3200 DDR SDRAM Memory

LeadTek nVIDIA® GeForce 6800 A400 TDH 128MB DDR Video Card

Realtek ALC850 8-Channel Codec Audio

Maxtor 160GB RAID 0 (2x80GB) 7200RPM SATA150 Hard Drive w/8MB Cache

SONY 16X DVD-ROM

NEC 8X Dual Layer DVD+/-RW DVD Recordable Drive

Microsoft® Keyboard and Optical Mouse

Regular Price ~~$1949~~ **Sale Price** $1899

ABS®

visit **www.abspc.com**

or call **800.876.8088**

- 1 Year Limited Parts and Labor Warranty
- 30 Days Money Back Guarantee
- Hours: Mon-Fri 8:30AM-5:30PM PST
- 1 Year 24/7 Technical Support Included

Price, specification, and terms are subject to change without notice. Illustrations may not accurately represent exact configurations priced. ABS® is not responsible for errors in typography and/or photography. 30 days money back guarantee does not cover opened software, parts, special orders merchandise, or dead pixels. Original shipping and handling fee along with return shipping charge are non-refundable. Products returned after 30 days or in a non-refundable condition are subject to a restocking fee. Onsite service may be provided by contracted third party provider. Technician will be dispatched if necessary following phone support. © 2004 All rights reserved. AMD, the AMD Athlon, AMD Arrow logo and combinations thereof are trademarks of Advance Micro Devices. Please check the website for latest specifications and pictures of actual product.

Copyrighted material

PC CLUB
www.pcclub.com

Work Hard, Play Harder!

PC Club recommends Microsoft® Windows® XP Professional for versatile Mobile Computing

Enpower Revolution

Ideal Balance of Ultimate Performance and True Mobiltiy

ENP947
- Microsoft® Windows® XP Home Edition
- **60GB** 7200rpm Hard Drive
- **1GB** DDR400 RAM up to 2GB
- **4x Dual Format DVD±RW Drive**
- TV-Tuner & Remote
- Built-in Wireless 802.11b/g Turbo 108Mbps
- Built-in 3-in-1 Flash Memory Card Reader
- Built-in CCD Digital Video Camera
- 1-Year Standard Limited Warranty

Mobile AMD® Athlon® 64 Processor

3400+

$2399

AMD 64 Mobile Athlon

Canon PowerShot A400 Digital Camera

3.2 Megapixel

$199.99

UPG04027 — Good thru 11/30/04

LITEON 16X Double Layer DVD+/-RW Drive

$89.99

A1547005/6 — Good thru 11/30/04

50 Pack 4X DVD-R

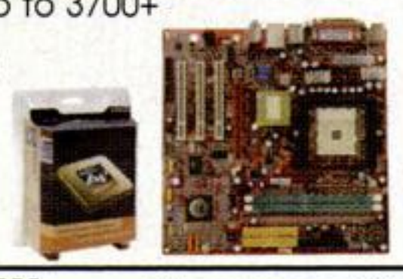
Get Ready To Make Movies

$17.99

A3458870 — Good thru 11/30/0

AMD Athlon 64 CPU and Motherboard Combo

MSI K8MM-ILSR Motherboard (A4854874)
- Supports AMD Athlon 64 up to 3700+
  2 X DDR400 up to 2GB
  AGP 8X, 3 x PCI, 8 x USB 2.0
  S3 Unichrome Graphics
  5.1 Audio, 10/100 LAN
  Serial ATA Raid, Firewire
- CPU Fan



AMD Athlon 64

3000+ $249

UPG01028

Western Digital 80GB SATA Hard Drive

No Rebate Hassle!

$69.99

A3494814 — Good thru 11/30/04

Gigabyte 6600GT PCI Express x16

Bundled FREE with DOOM 3

$189.99

A9630820 — GV-NX66T128D — Good thru 11/30/0

Powmax Demon 480W Power Supply

$30 Value

A6230480

Powmax Gamer Mid Tower

*With Purchase of Powmax Black or Silver Case

$49.99

A1330510 — Good thru 11/30/04

Centurion 5 Case

$95.99

A1306226 — Good thru 11/30/04

GEM 19" TFT LCD

$379.99

*After $100 mfr. mail-in rebate

A4628919 — Good thru 11/30/0

Visit http://www.pcclub.com/MaxPC04

Prices, specifications, availability and terms of offers may change without notice. Taxes, fees and shipping charges are extra. PC Club is not responsible for pricing or other errors, and reserves the right to cancel orders arising from such errors. Supplies limited to stock on hand and vary by location. All promotions stated do not apply to prior purchase. PC Club limited warranty policy is printed at the back of our invoice. Microsoft and Windows are registered trademarks of Microsoft Corporation. AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof, are trademarks of Advanced Micro Devicces, Inc. Other product and company names used for identification purpose only and may be trademarks of their respective companies.

Shop online or visit one of our **60 locations** nationwide

1-888-9PCCLUB

We accept Visa, MasterCard, Discover, American Express, and ATM.

Phone Order Hours: 7:00am to 6:00pm
Pacific Standard Time Monday to Friday

Price Good Thru 11/30
Unless Otherwise Stated

Copyright

PC CLUB

XC cube edition AV

Mini Bare System

My Digital Home Theater

High-performance PC + TV +CD/MP3 music player + DVD/VCD player
+FM radio + Photo viewer + PVR/DVR

FM Radio

TV

DVD Player

Photo Viewer

MP3/ CD Player

DVR/ PVR

PC

XC Cube, New Computing Life Style

EX65/ EX18

- EX65: Intel 865PE Chipset
- EX65: Intel 865G Chipset
- EX18: AMD nForce2-GT Chipset

EY65/ EY18

- EY65: Intel 865G Chipset
- EX18: AMD nForce2-GT Chipset

EZ65/ EZ18

- EZ65: Intel 865G Chipset
- EZ18: AMD nForce2-GT Chipset

Accentuate your personal or work space with five different colors for your selection

AOpen®

Visit our website at:

www.aopen.com

Click"Where to Buy" and get yours today!

1-888-97-AOpen

Available as a pre-built system or as a buitd-your-own kit at:

AJUMP www.Ajump.com
DIRECTRON www.directron.com
EXCALIBERPC www.excaliberpc.com
GAME PC www.gamepc.com
NEWEGG www.newegg.com
MWAVE www.mwave.com
MYAOPEN www.myaopen.com

@ 2004 AOpen America Inc.All rights reserved. AOpen is a trademark and the AOpen logo is a registered trademark of AOpen Inc.
All other trademarks are the property of their respective owners.

Copyrighted material

MSI
www.msicomputer.com

Between You And Victory Are You Properly Equipped?

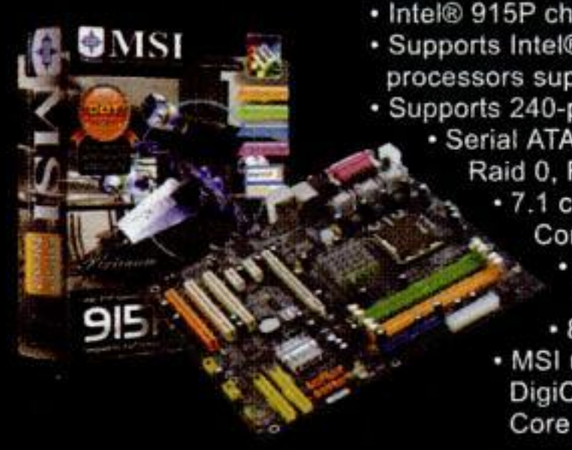
K8N Neo Platinum

- NVIDIA® nForce3 250 Gb chipset
- Supports 64-bit AMD® Athlon64 processor (Socket 754) 3400+ or up
- Supports 184-pin DDR400/333/266 memory up to 2GB
- NVIDIA nForce3 NV Gigabit LAN controller
- 4 S-ATA RAID, dual channel ATA 133/100/66/33
- IEEE 1394 Firewire x 3 ports
- AGP8X, 5 x PCI, 7.1 channel Audio
- Communication slot, 8 x USB 2.0 ports
- Live Update 3, D-bracket 2,
- MSI Corecell Chip, MSI Corecenter, DOT

K8N Neo2 Platinum

- NVIDIA® nForce3 250 Ultra chipset
- Supports 64-bit AMD® Athlon64 processor (Socket 939) 3500+, 3800+, Athlon 64 FX 53 or higher
- Supports 184-pin Dual Channel DDR400 memory up to 4GB
- Dual Integrated Ethernet 10/100/1000 LAN
- IEEE 1394 Firewire x 3 ports
- AGP8X, 5 x PCI, 7.1 channel Audio
- Communication slot, 8 x USB 2.0 ports
- Serial ATA RAID 0 or 1 or 0+1 (NV RAID utility)
- MSI utilities: Live Update 3, D-bracket 2, CoreCell, CoreCenter, DOT

915P Neo2 Platinum



- Intel® 915P chipset
- Supports Intel® LGA775 800MHz Pentium® 4 processors supporting Hyper-Threading Technology
- Supports 240-pin DDR2 400/533/667 memory up to 4GB
- Serial ATA 150 controller integrated in ICH6R (SATA Raid 0, Raid 1 and Matrix Raid)
- 7.1 ch Intel High Definition Audio, Communication slot
- PCI Express x 16 slot x 1, PCI Express x 1 slot x 2, PCI slot x 3
- 8 x USB 2.0 ports
- MSI unique features & utilities, including DigiCell, VPower, SafeBIOS, Cell Menu, Core Cell, Active MOS

925X Neo Platinum

- Intel® 925X chipset
- Supports Intel® LGA775 800MHz Pentium® 4 processors supporting Hyper-Threading Technology
- Support 240-pin DDR2 400/533/667 memory up to 4GB
- Serial ATA 150 controller integrated in ICH6R (SATA Raid 0, Raid 1 and Matrix Raid)
- 7.1 ch Intel High Definition Audio, Comm. slot
- PCI Express x 16 slot x 1, PCI Express x 1 slot x 2, PCI slot x 3
- 8 x USB 2.0 ports
- MSI unique features & utilities, including Digicell, VPower, SafeBIOS, Cell Menu, Core Cell, Active MOS

Available at:

Fry's Electronics Outpost.com
877 OUTPOST
www.outpost.com

MICRO CENTER
800 634 3478
www.microcenter.com

mwave.com
www.mwave.com

newegg.com
www.newegg.com

ZipZoomfly.com
www.zipzoomfly.com

GAME on
GEAR UP. PLAY HARD.

Copyrighted material

Broadway Photo

2922 Ave. L, Brooklyn, NY 11210

1-800-910-1130

Customer Service: 718-338-3028
Local & International: 718-338-1800
24 Hour Fax Hotline: 718-338-3029
Email: info@bwayphoto.com

Store Hours: Mon-Thurs: 9am-10pm • Fri: 9am-4pm • Sun: 10am-7pm • Sat: CLOSED

Visit our website at: www.bwayphotoandvideo.com

We specialize in Overnight Delivery. Place Your Order by 7:00 PM EST and Receive Your Order by the Next Business Day! For an Additional $29.95

DISCOVER VISA MasterCard AMERICAN EXPRESS COD

- 21 Day Satisfaction
- Next Day Air Available
- Worldwide Shipping
- No Surcharge on Credit Cards
- Government & School PO's Accepted

DIGITAL CAMERAS

NIKON Coolpix 8700
NEW!
- 1.8" LCD
- 8x Opt/4x Dig Zoom

$659.99

NEW! Coolpix 4100 ..... $219.99

NIKON Coolpix 5700
- 5.24 MegaPixels CCD
- 4x Optical Zoom
- 2/3" CCD

$439.99*

NEW! Coolpix 3700 ..... $219.99

OLYMPUS E-1
- 5.24 MegaPixels
- 2/3" CCD Screen
- USB

$1049.99

OLYMPUS C-5060
NEW!
- 5.1 Million Pixels
- 4x Optical Zoom

$414.99

D-540 ..... $159.99
NEW! D-575 ..... $189.99
D-580 ..... $214.99

SONY DSC-F828
- 1.8" LCD Screen
- 4x Digital Zoom
- 7x Optical Zoom

$669.99

DSC-F717 ..... $464.99
DSC-F88 ..... $369.99

SONY DSC-T11
NEW!
- 5.0 MegaPixels
- 2x Digital Zoom
- 2.5" LCD Screen

$379.99

DSC-T1 ..... $369.99
NEW! DSC-V1 ..... $364.99

CANON PowerShot G5
NEW!
- 5.0 MegaPixels
- 4x Optical Zoom

$404.99

A75 ..... $199.99
A80 ..... $234.99
NEW! A85 ..... CALL
A310 ..... $124.99

LEICA DigiLux2
- 5.0 MegaPixels
- 2.5" LCD Screen
- 2/3" CCD

$1499.99
NEW!

MINOLTA Dimage A2
NEW!
- 8.0 MegaPixels
- 7x Optical Zoom

$649.99

NEW! Maxxum 7 Digital ..... CALL
NEW! Dimage X31/X50 ..... CALL
NEW! Dimage Xg $209.99

NIKON Coolpix 4300
- 4.0 MegaPixels
- 3x Opt. Zoom/Dig. Zoom

$249.99

Coolpix 2200 ..... $109.99
Coolpix 3200 ..... $189.99
NEW! Coolpix 4200 ..... $289.99
NEW! Coolpix 5200 ..... $354.99

NIKON D70
NEW!
- 6.1 MegaPixels
- 1.8" LCD Screen

$779.99

D100 ..... $1149.99
NEW! D70 Kit $1049.99

OLYMPUS C-5000
NEW!
- 5.4 MegaPixels CCD
- 4x Dig./3x Opt. Zoom

$234.99

OLYMPUS C770
NEW!
- 4.0 MegaPixels
- 10x Opical Zoom

$384.99

NEW! C-60 ..... $319.99
NEW! C-765 ..... $324.99

SONY Mavica CD-500
- 4.0 MegaPixels
- 2.5" LCD Screen
- 1/1.8" CCD

$419.99

NEW! CD-350 ..... $289.99
NEW! FD-200 ..... $254.99

CANON DIGITAL REBEL KIT
- 6.3 Megapixel CCD
- 1x Opt./1x Digital Zoom

$719.99

Digital Rebel $629.99
EOS 10D $1049.99
EOS 1DS $5609.99

CANON PowerShot S500
NEW!
- 5.0 MegaPixels
- 3x Optical Zoom

$359.99

NEW! S410 ..... $284.99
NEW! S60 ..... $384.99
NEW! Pro 1 ..... $669.99
NEW! S1 IS $309.99

FUJI FinePix S2
- 3024x2016 Resolution
- USB

$1299.99

NEW! Finepix S3/3100/5100 ..... CALL
FP F700 ...$249.99 FP F710 ..... $324.99
NEW! FP E500/510/550 ..... CALL
NEW! FP F440/450 ..... CALL

MINOLTA Dimage Z2
NEW!
- 4.0 MegaPixels
- 10x Opt/4x Dig Zoom

$284.99

NEW! Dimage G600 ..... $304.99
Dimage Z1 ..... $234.99
NEW! Dimage Z3/Z10 ..... CALL

NIKON Coolpix 5400
NEW!
- 5.1 MegaPixels
- 4x Digital Zoom

$404.99

Coolpix SQ $229.99

NIKON D2H
- 5.47 MegaPixels
- SLR Type Dig. Camera
- Uses Nikon AF-D/I/S

$2329.99

NEW! D1X $2499.99

OLYMPUS C-8080
NEW!
- 8.0 MegaPixels
- 5x Opt/3x Dig Zoom

$629.99

NEW! Stylus 410 ..... $254.99

PENTAX Optio 555
NEW!
- 5.0 MegaPixel CCD
- 4x Dig./5x Opt. Zoom

$364.99

IST-Digital $969.99
S40 ..... $224.99 S4I $284.99
MX ..... $289.99 43WR $269.99

SONY DSC-P100
NEW!
- 5.1 MegaPixels
- 3x Opt./2x Dig. Zoom

$314.99

DSC-P10 ..$299.99 DSC-P41 ..$179.99
DSC-P73 ..$239.99 DSC-P93 ..$279.99
DSC-P150 ....CALL DSC-W1 ...$329.99

CANON EOS 1D Mark II
NEW!
- 11MegaPixels
- 2.0" LCD Screen

$3999.99

NEW! SD10 ..... $249.99
NEW! SD110 (in all colors) $209.99

KODAK DX6490
NEW!
- 13.89 MegaPixels

$304.99

DX4530 ....$234.99 DX6340 ....$189.99
DX6440 ....$269.99 DX7630 ....$329.99
DX7440 ....$274.99 CX7400 ....$219.99
LS743 ....$269.99 LS753 ....$294.99
DCS-Pro SLR C/N $3749.99

FUJI Finepix S7000
NEW!
- 6.3 MegaPixels
- 6x Optical Zoom
- 1.8" LCD

$389.99*

FP A340 ..... $154.99
FP S3000 .$189.99 FP S5000 ....$229.99
NEW! Finepix S20 Pro $479.99

SIGMA SD-10
- 10.2 MegaPixels
- IEEE 1394
- USB

$949.99

DIGITAL VIDEO

CANON GL-2
- IEEE 1394
- 20x Optical Zoom
- 100x Digital Zoom
- 2.5" LCD Screen

$1469.99

JVC GR-D93
NEW!
- 10x Optical Zoom
- 700x Digital Zoom
- 2.5" Color LCD

$379.99

NEW! GR-D230 ..... $439.99
NEW! GR-D33 ..... $259.99
NEW! GR-D72 ..... $294.99
GY-DV300 ..... $1609.99
GY-DV5000 ..... $3899.99

SONY DCR-VX2100
- 48x Digital Zoom
- 12x Optical Zoom
- 2.5" LCD Screen

NEW!

$1849.99

NEW! DCR-IP1 ..... $689.99
DCR-IP55 ..... $609.99
NEW! DCR-IP220 ..... $749.99
NEW! DHR-1000 ..... $2979.99
GVD1000 ..... $909.99
GVD800 ..... $599.99

SONY DCR-PC330
NEW!
- Mini DV Format
- Smallest DV Camera
- 2.5" LCD Screen
- BLUETOOTH

$949.99

NEW! DCR-PC109 ..... $589.99
NEW! DCR-PC350 ..... CALL

CANON ELURA 70
NEW!
- 1.33 MegaPixels
- 18x Optical Zoom
- 2.5" LCD Screen

$489.99

NEW! Optura 30 ..... $569.99
NEW! Optura 40 ..... $629.99
Optura XI $699.99
Optura 300 ..... $609.99
NEW! Optura 400 ..... $649.99
NEW! Optura 500 ..... $769.99
NEW! Elura 60 ..... $364.99
NEW! Elura 65 ..... $434.99

JVC JY-HD10U
- 200x Digital Zoom
- 10x Opt. Zoom
- 3.5" Color LCD
- USB

$2099.99

NEW! GR-DX77 ..... $369.99
NEW! GR-DX97 ..... $404.99
NEW! GR-DX307 ..... CALL
NEW! GR-HD1 ..... $1779.99

SONY DSR-PD170
- 2.5" LCD Screen
- 12x Optical Zoom
- 1.0 MegaPixels

NEW!

$2469.99

Special! DSR-PDX10 ..... $1499.99
SR-VS30 ..... $899.99
NEW! DCR-HC20 ..... $374.99
NEW! DCR-HC30 ..... $409.99
NEW! DCR-HC40 ..... $444.99
NEW! DCR-HC65 ..... $494.99
NEW! DCR-HC85 ..... $619.99
NEW! DCR-HC1000 ..... $1279.99

PANASONIC PV-GS200
NEW!
- 120xDigital Zoom
- 10x Optical Zoonm
- 2.5" LCD Screen

$604.99

NEW! PV-GS9 ..... $284.99
NEW! PV-GS12 ..... $309.99
NEW! PV-GS14 ..... $339.99
NEW! PV-GS15 ..... $359.99
NEW! PV-GS55 ..... $409.99
NEW! PV-GS120 ..... $459.99
NEW! PV-GS400 ..... CALL

CANON XL-1S
- 3 CCD
- 7" Color LCD

$2669.99

NEW! XL-2 ..... CALL
NEW! ZR-80 ..... $284.99
NEW! ZR-85 ..... $334.99
NEW! ZR-90 ..... $394.99

SONY DCR-TRV950
- 12x Optical Zoom
- 150x Digital Zoom
- 3.5" LCD

$1249.99

NEW! DCR-TRV260 ..... $279.99
NEW! DCR-TRV460 ..... $319.99

SONY DCR-DVD201
NEW!
- 10x Optical Zoom
- 120x Digital Zoom
- 2.5" LCD
- 1/5" CCD

$669.99

NEW! DCR-DVD101 ..... $579.99

PANASONIC AG-DVX100A
NEW!
- 3-CCD Imaging
- Super VHS
- 12x Optical Zoom
- IEEE-1394

$2499.99

NEW! AG-DV2500 ..... $1279.99
AG-DVC200 ..... $2699.99
AG-DVC7 ..... $719.99
NEW! AG-DVC30 ..... $1699.99
NEW! SV-AV25 ..... $209.99
NEW! SV-AV50A $259.99
NEW! SV-AV100 ..... $619.99
NEW! VD-RM50 ..... $444.99
NEW! VD-RM70 ..... $549.99

SCANNERS

CANON FS4000
- 5888 x 4000 pixels
- 4000 DPI Optical Resolution
- USB

$469.99

NIKON LS50
NEW!
- High Quality CCD Sensor
- 4000 DPI Optical Resolution

$489.99

LS-40 ..... $409.99

NIKON Super Coolscan LS-5000
- 4,000 dpi Optical Res.
- 2x-linear CCD
- Multiple film format

$869.99
NEW!

LS-8000 ..... $1999.99
LS-4000 ..... $899.99

PRINTERS

EPSON Stylus 2200P
- USB/Serial Port
- PC or Mac
- 6 Color Small Archival Links

NEW!

$539.99

EPSON Stylus 1280
NEW!
- Smudge Free Inks
- PC or Mac

$399.99

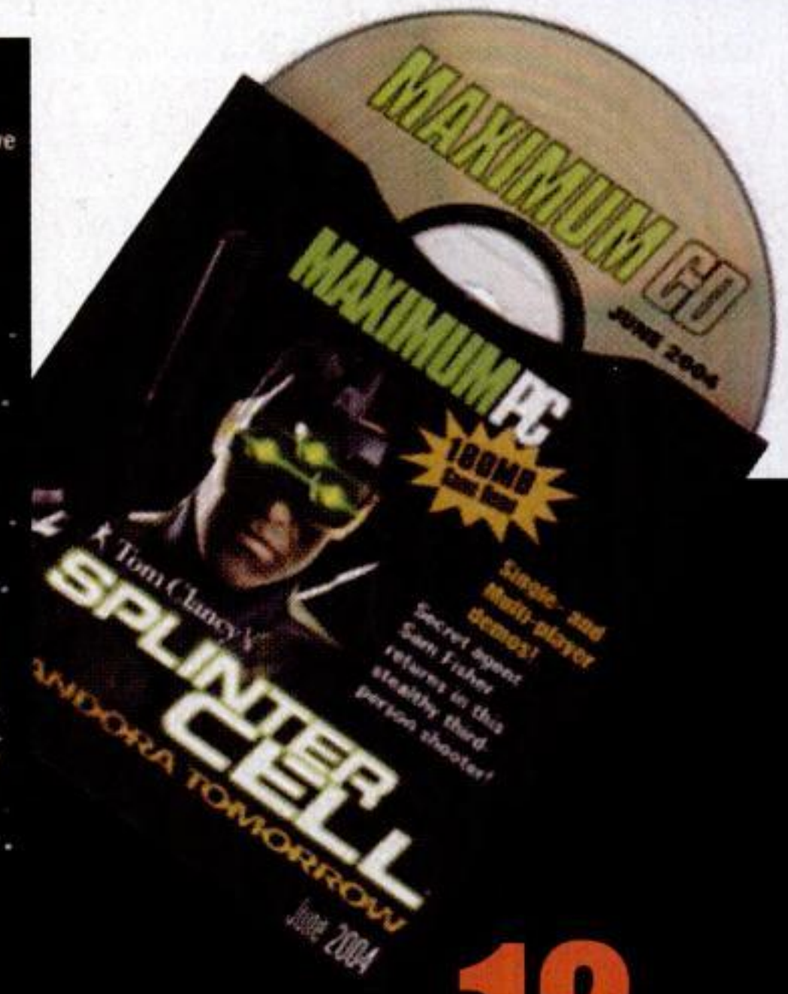
Stylus 3000 ..... $1179.99

OLYMPUS P440
NEW!
- Dye-Sublimation
- 1.8" LCD
- USB

$379.99

Policy: Visa, Mastercard, Discover, American Express, Diners Club, Money Orders, Certified Check, (Personal Checks up to 14,000.00 with name and address imprinted on check). C.O.D. orders are also accepted. Orders by mail please print name address and phone number clearly. Shipping methods - in the Continental U.S.A. will be via Fedex, U.P.S. or Air Mail. Over size items via truck. Shipping and Handling are additional. 21 days for return or exchange (video & digital 7 days) with prior authorization only. (Call customer service for authorization number). Shipping and Handling are not refundable. All returns are subject to a minimum restocking fee of 5%. Prices may reflect mail-rebate. All returned merchandise must be in new condition and must include all packaging and printed material in original, unaltered condition. Broadway Photo is not responsible for typographical errors. All items are covered by USA, International or Broadway Photo and Video Warranty. Prices subject to change. Please check our website for current prices. All our merchandise is brand new and factory fresh. Quantities are limited. Thank you and enjoy your order. MPC 10/04

Copyrighted material



12 issues + 12 CDs for only $29.95

A savings of 72% off the newsstand rate!

Subscribe to MaximumPC at www.maximumpc.com or call toll-free 1.800.274.3421

Offer good in U.S. only. Cover price is $8.99. One year, Canada: U.S. $37 (includes GST). One year, Foreign: U.S. $53. Prepaid in U.S. funds only. Please allow 6-8 weeks for delivery of first issue.

Copyrighted material

CRAZY PC

Your Source for Computer Accessories

www.crazypc.com

Swiftech Water Cooling

Cable Sleeves

7 Color Lighted Mouse Pad

Zalman Reserator

Sicuro 5.1 Gaming Speakers

Over 600 Case Mod, Cooling Products. and More!

www.crazypc.com

Toll Free 888-558-6005 Mon-Fri 9am-5pm Eastern

Prices are subject to change without notice. © 2004 CrazyPC. All Rights Reserved.

The **ULTIMATE** A+ Certification Bundle

Micro 2000's A+ Certification Bundle contains the two most powerful tools you could have in your arsenal.

Updated for the new 2003-2004 CompTIA requirements, this course contains extensive training guides, 3 hours of instructional video, and 7 hours of realistic simulations. Also included is the Challenge Interactive test simulator from Wave Technologies, which contains over 800 sample test questions to make sure you're ready to pass and get your certificate. This A+ course is a CompTIA authorized curriculum. The course also includes the LATEST version of Micro-Scope, the O/S independent diagnostic used by pros.

ALSO AVAILABLE SEPARATELY OR IN A SUPER BUNDLE:

The Universal Diagnostic Toolkit featuring the all new Micro-Scope 12, now on a bootable CD.

Contains the all new Micro-Scope version 12, the operating system-independent diagnostic that communicates directly to the PC's hardware with results far more accurate than Windows-based diagnostics. The new version now comes on bootable CD and includes a new graphic interface, support for AC97 sound cards, and a CMOS and Master Boot Record backup utility. Micro-Scope handles all the latest CPUs including new 64-bit processors from Intel and AMD. For PCs that won't boot, use the POST-Probe BIOS reader card. Simply pop it into a free ISA, EISA, or PCI slot and turn on your PC. POST-Probe will display the exact problem for instant hardware debugging.

CALL TODAY 888-389-5596

Micro2000

1100 E. Broadway • 3rd Floor • Glendale, CA 91205 Phone: 818-547-0125

netsales@micro2000.com • www.micro2000.com • In Europe Call: +44 1438 22 55 50

Maximize Performance.

INTERNET ONLY SPECIAL!

Features:

Customizable Burn-In
Comphrehensive Stress Loading
Detailed System Information
Report ID Ticketing
Multi-Language Support
No Installation Required
Windows 95/98/ME/2000/XP Compatible

Microsoft Windows
Supports Win98/ME/NT/2000/XP

Benefits:

Stability Testing for Overclockers
Assists in Troubleshooting & Diagnostics.
Perfect for Burning In New Computers
Catch Intermittent Problems

Kit Includes:

WinStress Test CDRom
WinStress Manual
LPT & COM Port Loopback Plugs
Technician Certified Labels

GSA Contract Number GS-35F-0260L

ULTRA-X, INC. www.uxd.com

Special Online Offer:

http://www.uxd.com/maxpc

Tel: 1-888-722-3734

COMPUTERGEEKS.COM

Great Gifts & Geeky Gadgets!

10% OFF!*

FREE with purchase of $100.00 or more!

Lowepro TX 500 Black Padded Video Camera Bag

Part #: TX500

A $24.50 Value!

*See Savings Code for details

Great Stocking Stuffer!

VISA MasterCard AMEX DISCOVER

TEL: 760.726.7700

9am - 4:30pm Pacific Time M-F
24/7 Online Ordering
Online Package Tracking
Online Order History
Fast, Safe, Secure
APO/FPO O.K.!

At this special time of year, ComputerGeeks.com would like to thank our loyal customers and welcome our new ones. As Santa's Official Geeky Gadget Supplier™ for the 2004 Holiday Season, we are happy to offer a *10% discount on all products not already marked "GEEK Special!" And as an added bonus for MaximumPC readers, a free Lowepro TX500 padded camera bag when you spend $100 or more and use Secret Savings code: MAXMAS04!

Be sure to check out our Geeky Gift Guide– Gift suggestions for every budget!

Use this coupon code during checkout to receive the savings indicated in this ad

SECRET SAVINGS CODE: MAXMAS04

Code expires 01.01.05. Not valid with any other offer. All offers subject to availibility.

Fujitsu-Siemens Socket 478 800FSB ATX MB with SPDIF, Firewire, USB 2.0, Ethernet and Sound

Only **$22.50!**

With Secret Savings Code: MAXMAS04

Aiptek Pocket DV II 1.3MP 4-in-1 Digital Camera/Camcorder

Only **$52.00!**

With Secret Savings Code: MAXMAS04

New products arrive daily! Please visit our website for a complete list of products and pricing. Our real-time inventory sytem ensures that everything on our site is in stock, and calculates shipping charges dynamically based on products, shipping method, and destination. Visit our site regularly for Daily Specials, and sign up for GeekMail e-Newsletters for Subscriber-Exclusive offers and discounts that sizzle!

MAXIMUM PC

12 issues PLUS 12 CD-Roms for only $29.95

A savings of 72% off the newsstand rate!

Subscribe to MaximumPC at www.maximumpc.com or by calling toll-free 1.800.274.3421.

Offer good in U.S. only. Cover price is $8.99. One year, Canada: U.S. $37(includes GST). One year, Foreign: U.S. $53. Prepaid in U.S. funds only. Please allow 6-8 weeks for delivery of first issue.

Copyrighted material

HighSpeed PC

Specialty Computer Hardware

Catch the wave! Innovatek Liquid Cooling

New!Convection Radiators
Complete Kits
Powerful 12v Pumps
UV Tubing

Tons of accessories :
Full Range of Water Blocks
Flow and Temp Guages
for CPU, HDD,
Video, Chipset

Official US Distributor for Innovatek: Reseller Inquiries Welcomed

Visit us at: www.highspeedpc.com

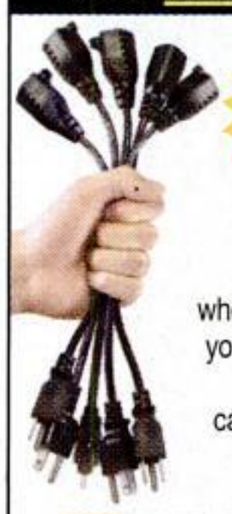
Questions? support @ highspeedpc.com

Reseller Rating scores a Perfect 10 for customer satisfaction!

got outlets?

- Just plug those bulky adapters into the LIBERATOR and free up more outlets.
- **Perfect for** Home Theaters, Home Offices, Workstations, UPS systems, every room in your home or office.

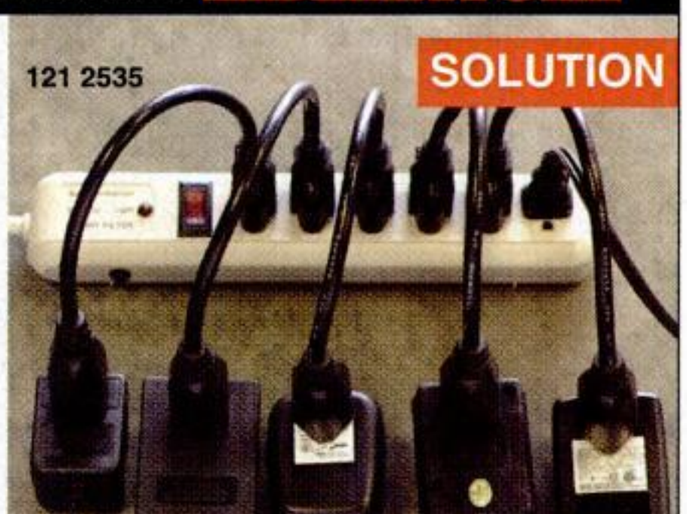
use ALL outlets with the LIBERATOR!



5 Pack of LIBERATORS $8.95

Use **Keycode S423501** when ordering and get your **FREE** 180 page **Cyberguys!®** catalog packed with **over 3,000** great products!

CYBERGUYS!



ORDER NOW!

Call 800-892-1010 or go to cyberguys.com

MEMORY for PC and Apple, Laptops, Digital Cameras, MP3 Players and more ...

WE CAN BEAT Crucial, Kingston, Comp-USA, ANYONE!

AND, WE GIVE YOU

FREE SHIPPING!

- ✓ We Manufacture Our Memory Using the Highest Quality Components
- ✓ Lifetime Warranty
- ✓ Compatibility Guaranteed
- ✓ Free Technical Support
- ✓ Experienced Sales Staff Since 1994

18004MEMORY.com™

1-800-4-MEMORY

1-800-463-6679

http://www.18004memory.com

2CoolShopping

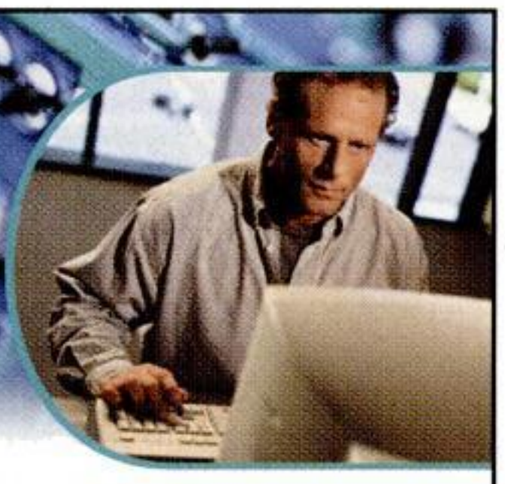
www.2CoolShopping.com

Free Shipping

for Every Item, No Limit!!

High Quality Computer Parts Store

Freedom to Learn. Power to Succeed.



Earn your degree at home and start a career in Internet Technology. With nationally accredited Education Direct, you're free to learn with flexible study deadlines and access to online student support.

Contact Education Direct for FREE information today!

For Fastest Service, Call Toll Free:

1-800-572-1685 ext. 4485

Call anytime, 24 hours a day, 7 days a week.

Or visit www.EduDirect-usa.com

Online enter ID#: AFYSB4T

Or mail coupon today!

593AA

THOMSON EDUCATION DIRECT

Dept. AFYSB4T
925 Oak Street
Scranton, PA 18515-0700

Yes! Please send me **FREE** information about how I can earn my degree at home.

No obligation.
Please check one
of the following.

- ☐ 64 Applied Computer Science (ASB Degree)
- ☐ 404 E-Commerce Administration (AST Degree)
- ☐ 65 Electrical Engineering Technology (AST Degree)
- ☐ 67 Electronics Technology (AST Degree)
- ☐ 407 Graphic Design (AST Degree)
- ☐ 403 Internet Multimedia & Design (AST Degree)
- ☐ 27 PC Repair
- ☐ 37 Visual Basic®.NET Programmer
- ☐ 36 Visual C#®.NET Programmer
- ☐ 402 Web Programming (AST Degree)

Name _____ Age _____

Street _____ Apt.# _____

City/State _____ Zip _____

Phone ( ) _____

E-mail _____

Looking to save on Games?

Look no further....Go to where gamers go!

GoGamer.com

Play More, Pay Less

Best Selling Titles...visit us @ www.gogamer.com

Copyrighted material

MAXIMUMPC Rig of the Month

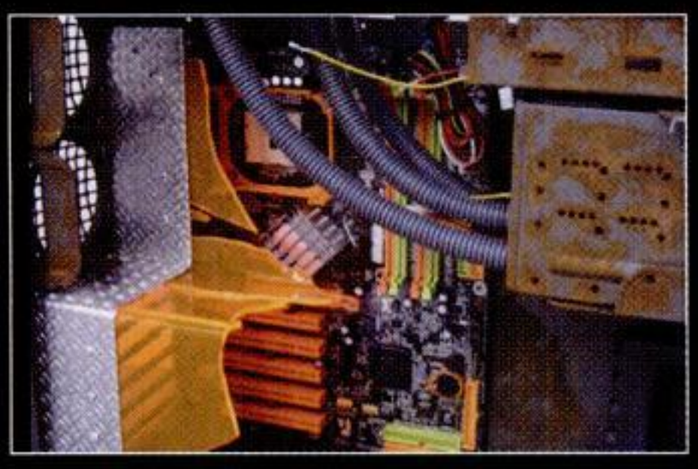
THIS MONTH: Piloux's Half-Life 2 PC

Making a case mod that manages to capture the essence of the year's most anticipated game—psssssst, it's *Half-Life 2*—isn't a task for a novice modder. And were Piloux a novice, it's unlikely he would have been contacted by Valve founder Gabe Newell—Mr. Half-Life himself—to custom-create a tribute to the upcoming game for Valve's HQ. That's quite a compliment, and clearly, Piloux was the right man for the job.

The resulting rig perfectly mimics the game's derelict industrial areas, where signs of decay from rampant corrosion and rust are everywhere. However, Piloux's biggest challenge was making the Valve-commissioned mod different from his earlier *Half-Life*-themed Black Mesa mod, which earned him Newell's attention in the first place. "I didn't want to build the same mod, I wanted to make it in the same spirit but different enough to give Valve something unique."

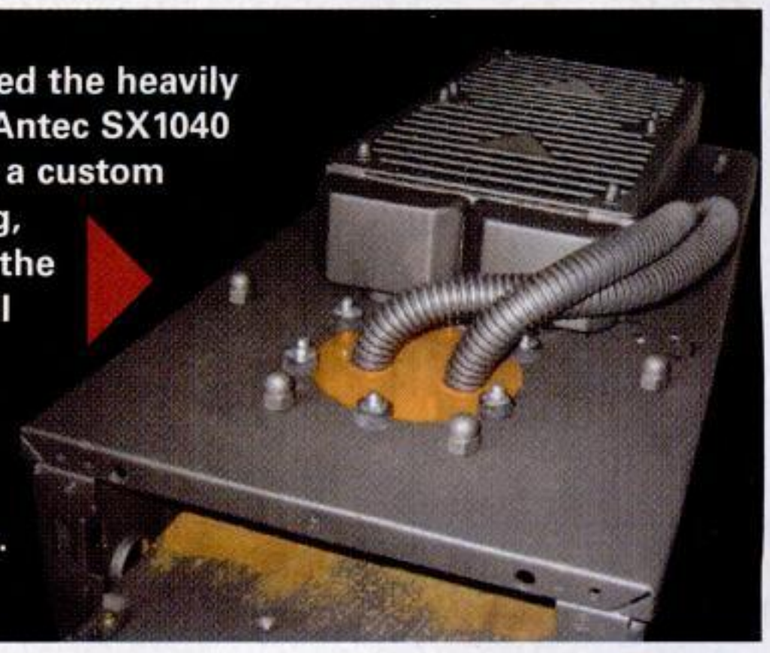
Piloux gave the case a corrosive finish by using several layers of paint. He started with a flat gray, then added a rust-colored layer, and finished with orange highlights as part of an overall motif.

Dremeled bullet holes and hand-cut Plexiglas shards throughout the case show impressive attention to detail.



Being tight with Valve, Piloux had access to the as-yet-to-be-released game. "I wanted to include in the case something that comes directly from [*Half-Life 2*]." The jagged, craggy surface creeping up the front and side of the case is a replica of the combine wall that slowly destroys the game's city.

Piloux fitted the heavily modified Antec SX1040 case with a custom cooling rig, including the Black Ice II Xtreme Radiator mounted on the case's top.



A common coffee can and a trip to the hardware store provided Piloux with everything he needed to create Valve's trademark, um, valve.

If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with high-res digital pics and a 300-word write-up.

MAXIMUM PC (ISSN 1522-4279) is published monthly by Future Network USA, 150 North Hill Drive, Suite 40, Brisbane, CA 94005, USA. Periodical class postage paid in Brisbane, CA, and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (12 issues) US: $20; Canada: $26; Foreign: $42. Basic subscription rates "Deluxe" version (w/CD): one year (12 issues/12 CD-ROMs) U.S.: $30; Canada: $40; Foreign $56. US funds only. Canadian price includes postage and GST (GST#R128220688). Postmaster: Send changes of address to Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659. Standard Mail enclosed in the following edition: None. Ride-Along enclosed in the following editions: B, C, C1, C2, C3. Int'l Pub Mail# 0781029. Canada Post Publications Mail Agreement #40043631. Returns: 4960-2 Walker Road, Windsor ON N9A 6J3. For customer service, write Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659; Maximum PC, 150 North Hill Drive, Brisbane, CA 94005. Future Network USA also publishes PC Gamer, PSM, MacAddict, and Official Xbox. Entire contents copyright 2003, Future Network USA. All rights reserved. Reproduction in whole or in part is prohibited. Future Network USA is not affiliated with the companies or products covered in Maximum PC. PRODUCED AND PRINTED INTHE UNITED STATES OF AMERICA.

Copyrighted material

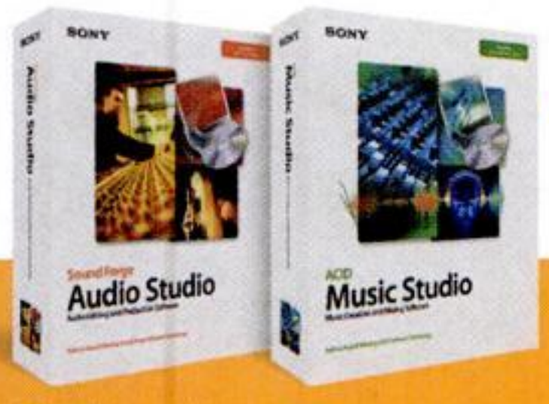
SONY

Moving Pictures.

Your movies and photos define who you are. Vacation films, snapshots or portraits — you always capture the joy, drama, and emotion that make up your life. Pictures that mean something. Pictures that move you.

Sony® Vegas® Movie Studio™ software brings more to your memories with easy-to-learn editing, Hollywood magic, and soundtrack creation. Mix still photos and movies, with music and effects, to experience your favorite moments in a whole new way. Turn video and snapshots into unforgettable presentations, complete with songs, titles, credit rolls and special effects. Interactive tutorials show you how to bring a new level of excitement to your work, hobby or home productions. Easily create DVDs that entertain and thrill you like never before.

Built on our award-winning Vegas software technology, Vegas Movie Studio and DVD Architect™ Studio software together offer opportunities to explore your movies and photos in a new light; to bring a new level of passion to your work; to affect, stir and excite you, your family and friends. To create unforgettable moving pictures.



Each sold separately.

Welcome to Your Studio.

Our entire digital media suite works seamlessly together to provide you with the most powerful video, audio and music creation tools available. For more information visit **sony.com/mediasoftware** or your local retailer.

BEST BUY · COMPUSA WHERE AMERICA BUYS TECHNOLOGY · circuit city

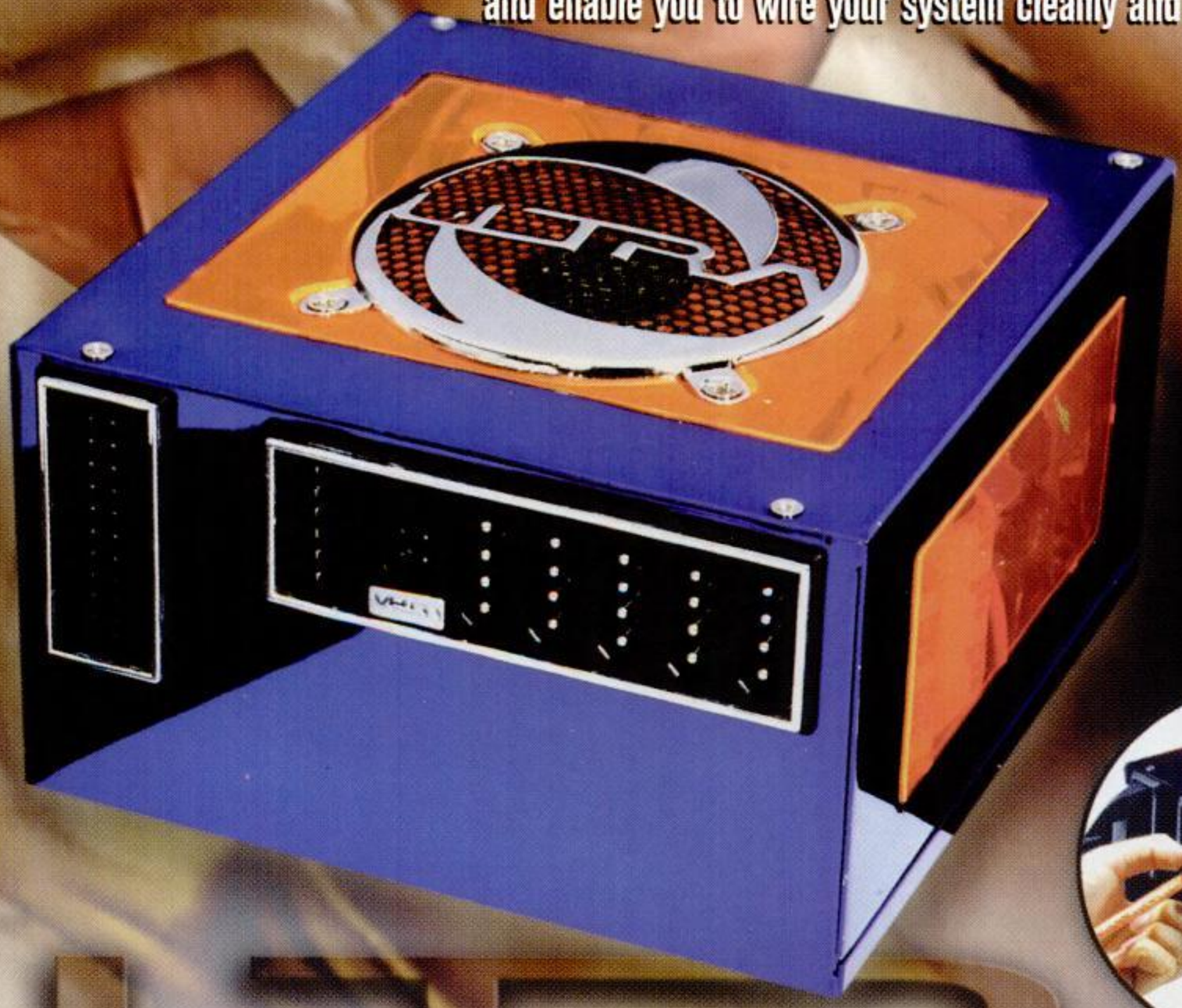
© 2004 Sony Pictures Digital Inc. All rights reserved. Sega and Vegas Movie Studio are trademarks or registered trademarks of Sony Pictures Digital Inc. All other trademarks are the property of their respective owners. www.sony.com/mediasoftware • 1.800.577.6642

Copyrighted material

INTRODUCING THE WORLD'S FIRST
MODULAR POWER SUPPLY.

WORSHIP THE POWER

Introducing the revolutionary new X-Connect modular power supply.
No hard-wired cables; the eight UV-ready included cables "plug-in"
and enable you to wire your system cleanly and efficiently.



ULTRA X-CONNECT POWER SUPPLY

Use Only The Power Cables You Need! Includes Eight X-Connect Cables! End "Cable-Clutter" With The Cleanest Cabling System Ever! Plus, the X-Connect PSU's advanced power output technology delivers peak power 100% of the time. Ultra's new X-Connect. The evolution of power.

TO ORDER 1-800-682-4711 ON THE WEB www.ultraproducts.com

Patent Pending © 2003 Ultra Computer Products, Inc. www.ultraproducts.com

Copyrighted material